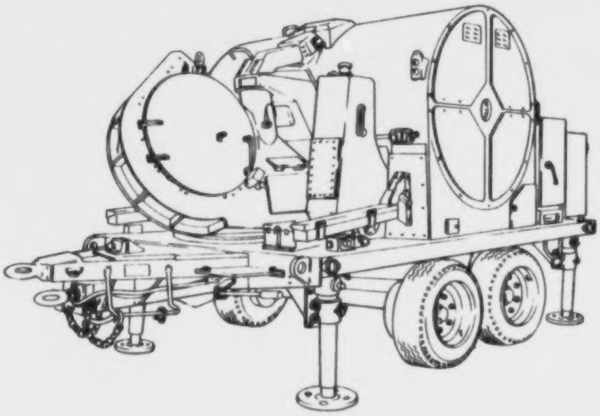
9- 1095-205-34-5

**TM 9-1095-205-34-5**

TECHNICAL MANUAL

# MAINTENANCE INSTRUCTIONS DIRECT SUPPORT/GENERAL SUPPORT MAINTENANCE



FUEL SYSTEM (DIRECT SUPPORT)
Page 13-1

COOLANT HEATER INSTALLATION
(DIRECT SUPPORT)
Page 14-1

DIESEL POWERED HYDRAULIC
PUMPING UNIT
(DIRECT SUPPORT)
Page 15-1

# M128 GROUND VEHICLE MINE DISPENSER (1095-00-397-3456)

HEADQUARTERS, DEPARTMENT OF THE ARMY

September 1984

READEX FICHE best copy available

D 101.11:

# WARNINGS AND FIRST AID DATA

**WARNING**

CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU

Carbon monoxide is colorless and odorless, but it can kill you. Breathing carbon monoxide causes headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Heavy exposure can cause brain damage or death. Exhaust fumes of fuel burning heaters and internal combustion engines contain carbon monoxide. Carbon monoxide becomes dangerously concentrated when there is no air movement. Always follow safety precautions when the engine coolant heater or dispenser diesel engine is operated for any purpose.

1. DO NOT operate coolant heater or diesel engine in a closed place unless the place has a lot of moving air.
2. DO NOT idle diesel engine for long periods without ventilation.
3. BE ALERT at all times for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY remove affected crew to fresh air. Keep them warm. DO NOT PERMIT PHYSICAL EXERCISE. If necessary, give them artificial respiration.

   FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.
4. BE AWARE: the chemical, biological, and radiological (CBR) protective mask WILL NOT protect you from carbon monoxide.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

**WARNING**

Cleaning solvent can explode and can burn. Keep it away from heat or open flame. NO SMOKING. Solvent fumes can make you sick. USE IN A WELL VENTILATED AREA. Keep solvent off your skin as much as you can.

**WARNING**

Asbestos dust can be harmful to your health. Clean brake assembly parts in ventilated area.

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel. Remove battery ground cable before working on fuel system.

**WARNING**

You will be injured if dispenser falls on you. Use hydraulic jack to support dispenser during and after removal of leveling jack. Remove and install only one leveling jack at a time.

GO TO NEXT PAGE

## WARNINGS AND FIRST AID DATA — Continued

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**WARNING**

Flying bits of metal could blind you. Always wear goggles when you cut metal or use power tools.

**WARNING**

Dirt and dispenser fluids may hurt your eyes. Wear goggles when working under the chassis.

**WARNING**

Compressed air can hurt you. Never aim air at soldiers or use more pressure than 30 psi (207 kPa). Always wear goggles.

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

**WARNING**

Hydraulic system pressure could reach 3400 psi (23,450 kPa) during startup. A high pressure fluid jet can hurt you. Wear goggles when you check for leaks.

**WARNING**

Gas that flows into accumulator during precharging is under high pressure. A high pressure gas jet can hurt you. Make sure gas chuck and nitrogen supply connections are tight.

**WARNING**

Emergency valve drain plug is under pressure and can fly off and hurt you. Open air tank drain valve before you remove emergency valve drain plug.

**WARNING**

Hot coolant can burn you. Do not get hot coolant on skin. Turn radiator cap slowly to let out pressure.

**WARNING**

Coolant heater exhaust gases and exhaust tube can burn you. Keep your hands at a safe distance from coolant heater exhaust tube while coolant heater is running.

**WARNING**

Running the engine and operating the dispenser causes many parts to heat up. DON'T TOUCH any of the following parts when they are hot from use.

- Coolant Hoses
- Exhaust Pipe
- Oil Filters
- Hydraulic Pumps
- Radiator
- Engine Parts

**WARNING**

Extremely cold and hot parts can injure you. Use gloves when handling extremely cold and hot parts.

**WARNING**

Launcher guides have sharp edges that can hurt you. Wear gloves when handling launcher guides.

**WARNING**

Holes in rocker arm shaft have sharp edges that can hurt you. Be careful when you handle rocker arm shaft.

**WARNING**

Engine parts could hurt you. Stay clear of moving parts when engine is running.

**WARNING**

Parts rotating at high speeds can harm you. Keep objects away from parts rotating at high speeds.

**WARNING**

Reel can hurt you when it rotates. Hold reel when removing or installing master link.

**WARNING**

Launcher can harm you when it oscillates. Make sure manual bypass valve is at OPEN before you move launcher by hand.

**WARNING**

Air chamber assembly cover is spring loaded and could fly off and hurt you. Hold chamber assembly together during cover removal.

**WARNING**

Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment when power unit is being removed or installed.

GO TO NEXT PAGE

## WARNINGS AND FIRST AID DATA — Continued

**WARNING**

Spring loaded radiator vanes can hurt you. Do not let vanes snap shut on your fingers.

**WARNING**

Hydrogen gas from batteries can explode and hurt you. Do not allow sparks near batteries. Battery acid can burn or blind you. Do not get acid on your skin or eyes.

**WARNING**

Battery posts and cables touched by metal objects can short circuit and burn you. Do not wear jewelry, including watches, or let ID tags hang down, when working on the electrical system. Keep tools away from posts, wires, and terminals.

**WARNING**

A short circuit can cause welding heat. Make sure MASTER POWER switch is in down (OFF) position when you repair electrical circuits or parts.

**WARNING**

Axle assembly and wheels are heavy. They can fall and hurt you when springs come out of spring shackles. Do not get under wheels and axle unless they are properly supported.

**WARNING**

Launcher can hurt you when it oscillates or if it throws tools or parts during oscillation. When engine is running, stay clear of launcher deck, and keep tools and parts off launcher deck.

**WARNING**

Current of 50 — 70 amp can cause severe burns or other injury. Make sure all connections are tight. Keep tools clear of armature during test. Do not wear jewelry or watch. Wear goggles.

**WARNING**

Capacitor can discharge and injure you. Discharge capacitor before working on circuit.

**WARNING**

You can be hurt or killed if practice mines strike you after they have been launched. Do not stand closer than 70 yd (68.5 m) behind mine dispenser that is dispensing practice mines.

INSERT LATEST CHANGED PAGES.
DESTROY SUPERSEDED PAGES.

# LIST OF EFFECTIVE PAGES

**NOTE**

The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 607
CONSISTING OF THE FOLLOWING:

| PAGE NO. | *CHANGE NO. | PAGE NO. | *CHANGE NO. |
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**TECHNICAL MANUAL**

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 1 September 1984

# DIRECT SUPPORT/GENERAL SUPPORT MAINTENANCE MANUAL

## M128 GROUND VEHICLE MINE DISPENSER

### REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander; U.S. Army Armament, Munitions and Chemical Command; ATTN: DRSMC-MAS (R); Rock Island, IL 61299. A reply will be furnished to you.

## VOLUME 5

Page

WARNINGS AND FIRST AID DATA .......... a

LIST OF EFFECTIVE PAGES .......... A

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- Section I Repair Parts, Special Tools, TMDE, and Support Equipment .......... 13-1
- Section II Maintenance Procedures .......... 13-3

CHAPTER 14 COOLANT HEATER INSTALLATION (DIRECT SUPPORT) .......... 14-1
- Section I Repair Parts, Special Tools, TMDE, and Support Equipment .......... 14-1
- Section II Maintenance Procedures .......... 14-3

CHAPTER 15 DIESEL POWERED HYDRAULIC PUMPING UNIT (DIRECT SUPPORT) .......... 15-1
- Section I Repair Parts, Special Tools, TMDE, and Support Equipment .......... 15-1
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# CHAPTER 13

# FUEL SYSTEM (DIRECT SUPPORT)

## Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

### 13-1 COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

### 13-2 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are authorized for the M128 Ground Vehicle Mine Dispenser.

### 13-3 REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list TM 9-1095-205-34P, covering direct support and general support maintenance for this equipment.

## Section II. MAINTENANCE PROCEDURES

### 13-4 FUEL TANK ASSEMBLY

**DESCRIPTION**

This task covers:
A. FUEL LEVEL TRANSMITTER REMOVAL (p 13-4)
B. FUEL LEVEL TRANSMITTER INSTALLATION (p 13-5)
C. FUEL SHUTOFF VALVE REMOVAL (p 13-7)
D. FUEL SHUTOFF VALVE INSTALLATION (p 13-8)
E. REMOVAL (p 13-10)
F. DISASSEMBLY (p 13-12)
G. REASSEMBLY (p 13-14)
H. INSTALLATION (p 13-15)

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**INITIAL SETUP**

***Tools and Special Tools:***
- General mechanic's tool kit 5180-00-177-7033:
  - 9/16 inch open end wrench (2)
  - No. 2 cross tip screwdriver
  - 13/16 inch open end wrench
  - 1/4 inch hex key
  - 9/16 inch box end wrench
  - Diagonal cutting pliers
  - Slip joint pliers
  - 7/16 inch socket
  - Ratchet handle
  - 2 inch extension
  - Putty knife
  - Pry bar
- 11/16 inch box and open end box wrench 5120-00-895-9572
- Cap and plug set 5340-00-450-5718
- 3/8 inch drive socket wrench set 5120-00-322-6231:
  - Ratchet handle
  - 9/16 inch socket
  - 10 inch extension
- Goggles 4240-00-269-7912

***Materials/Parts:***
- Lock washer (5) 5310-00-045-3299
- Lock washer (4) 5310-00-582-5965
- Self-locking nut (12) 5310-00-087-4652
- Safety wire, Item 24, Appendix B
- Gasket 5330-01-142-1040
- Gasket 5330-01-142-1039
- Sealing compound, Item 25, Appendix B
- Rags, Item 22, Appendix B
- Solvent, Item 28, Appendix B

***Personnel Required:***
- Mechanic
- Helper

***References:***
- TM 9-1095-205-10
- TM 9-1095-205-20
- FUEL SYSTEM LINES AND FITTINGS, Page 13-19

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**OVERVIEW**

Seal fluid line fittings. Nonflared fittings or fittings without seal, gasket, preformed packing, or other sealing hardware need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

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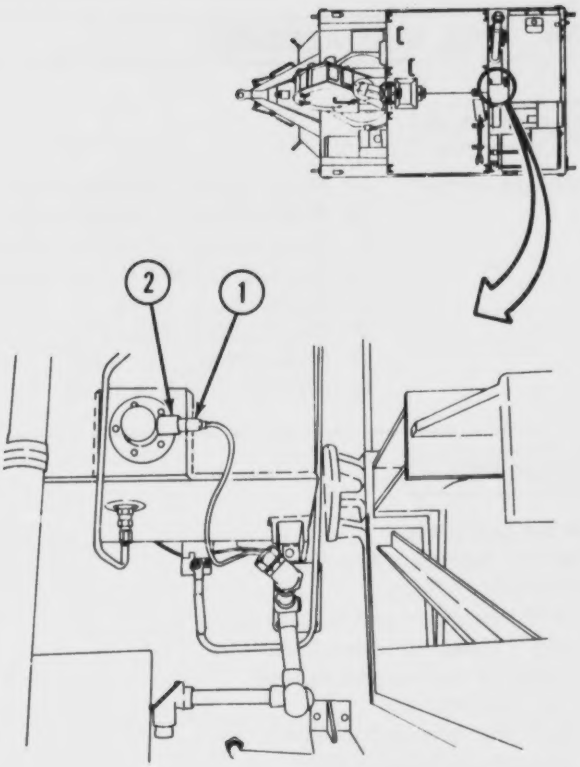
## 13-4 FUEL TANK ASSEMBLY — Continued

### A. FUEL LEVEL TRANSMITTER REMOVAL



**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

1. DISCONNECT LEAD 13 ELECTRICAL PLUG CONNECTOR (1) FROM FUEL LEVEL TRANSMITTER (2).

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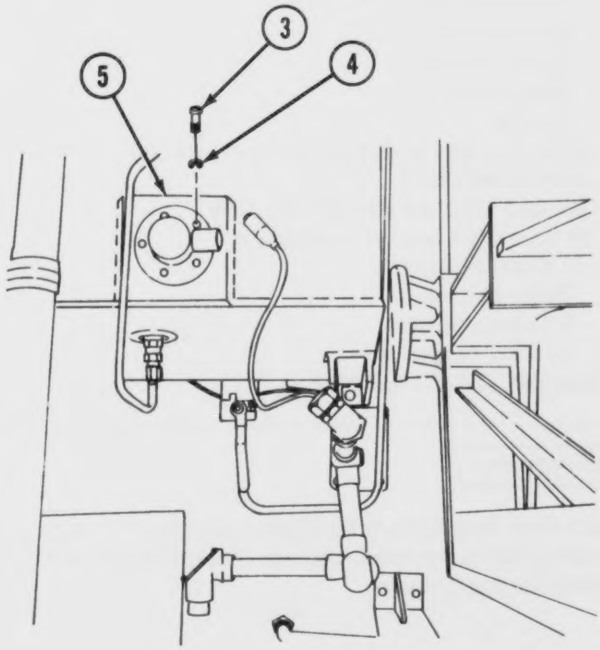


**WARNING**

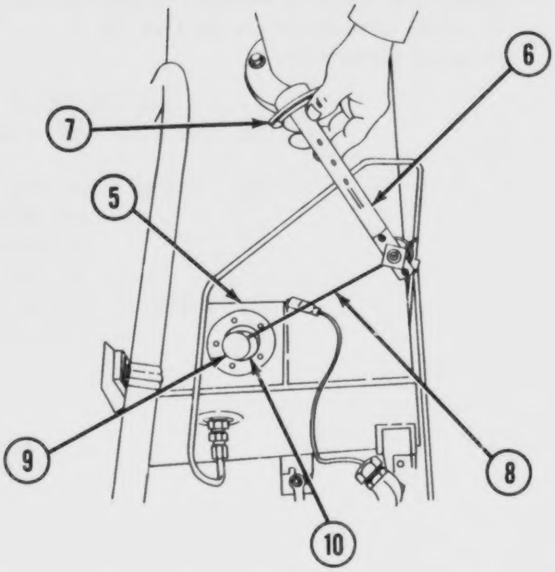
Cleaning solvent can explode and can burn. Read warning on front page of this manual.

**CAUTION**

Fuel level transmitter arm and float can be damaged during removal. Remove arm and float slowly from fuel tank weldment.

2. REMOVE FUEL LEVEL TRANSMITTER FROM FUEL TANK WELDMENT.
   - Remove five screws (3) and lock washers (4) from fuel tank weldment (5). Use No. 2 cross tip screwdriver. Discard lock washers.

- Carefully remove transmitter (6) with gasket (7), arm (8), and float (9) from fuel tank weldment (5).
- Cover hole (10) in fuel tank weldment (5). Use clean rag.
- Remove gasket (7) from transmitter (6). Use putty knife. Discard gasket.
- Clean gasket mating surfaces on transmitter (6) and fuel tank weldment (5). Use putty knife, solvent, and rags.



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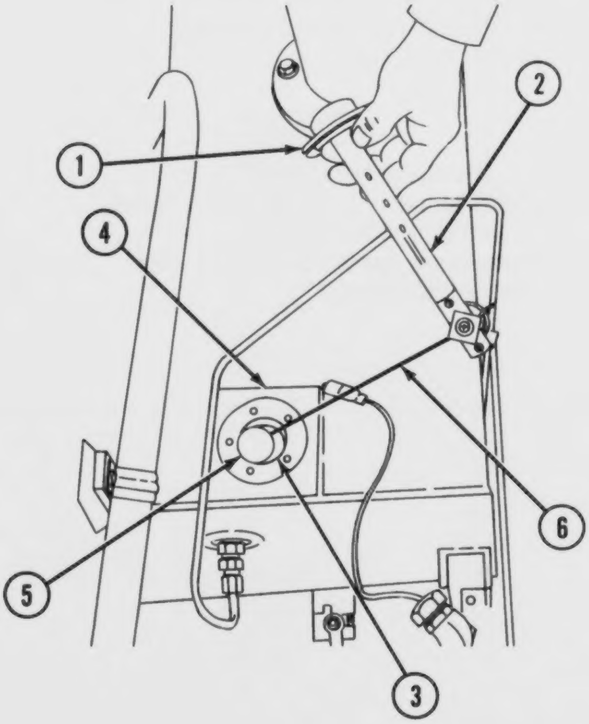
## B. FUEL LEVEL TRANSMITTER INSTALLATION

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

1. INSTALL FUEL LEVEL TRANSMITTER IN FUEL TANK WELDMENT.
   - Install new gasket (1) on transmitter (2).
   - Remove rag from hole (3) in fuel tank weldment (4).
   - Install transmitter (2) with float (5), arm (6), and new gasket (1) in fuel tank weldment (4).



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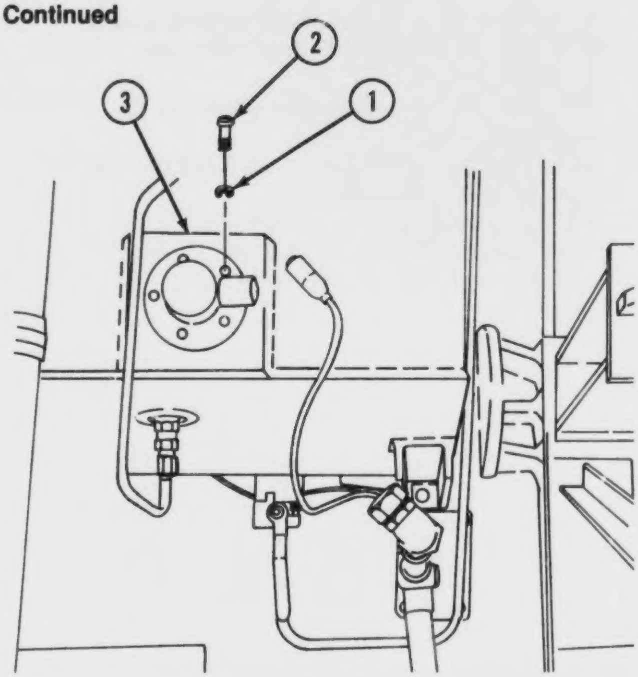
## B. FUEL LEVEL TRANSMITTER INSTALLATION — Continued

- Install five new lock washers (1) and screws (2) in fuel tank weldment (3). Use No. 2 cross tip screwdriver.



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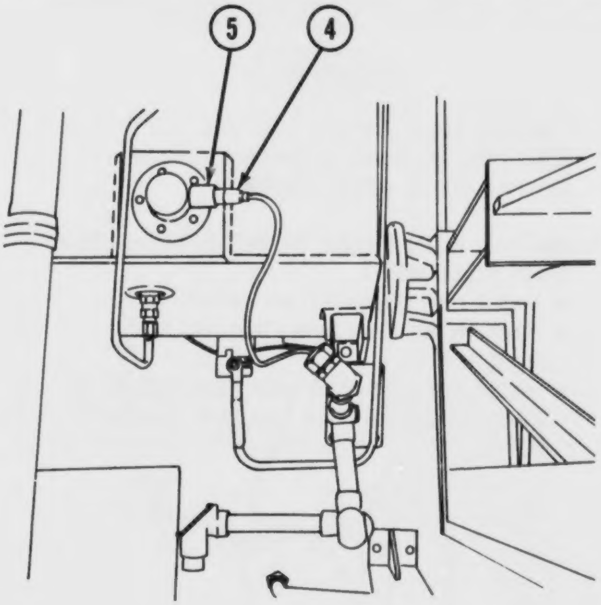
2. CONNECT LEAD 13 ELECTRICAL PLUG CONNECTOR (4) TO FUEL LEVEL TRANSMITTER (5).

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)



## C. FUEL SHUTOFF VALVE REMOVAL

### NOTE

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

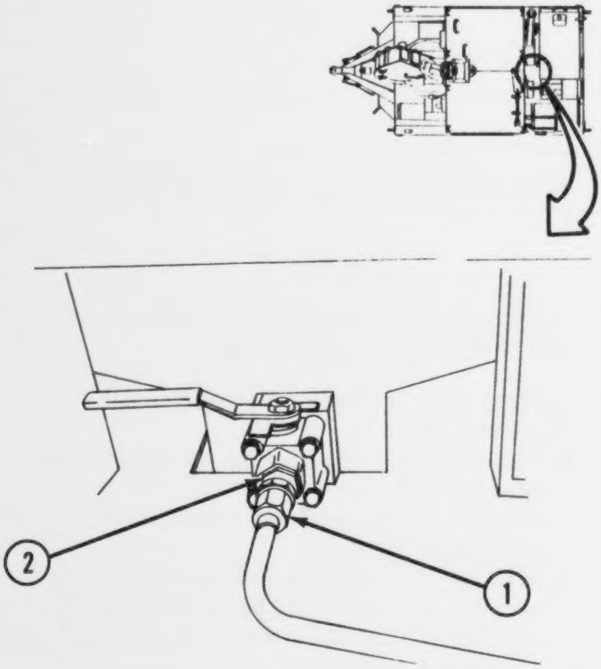
**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

1. DISCONNECT SUCTION LINE TUBE ASSEMBLY FROM FUEL SHUTOFF VALVE ADAPTER.
   - Disconnect tube assembly (1) from adapter (2). Use 13/16 inch open end and 11/16 inch box and open end box wrenches.
   - Plug tube assembly, and cap adapter.



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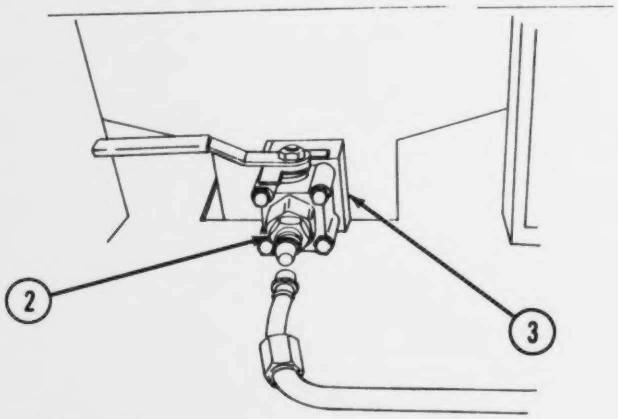
2. REMOVE FUEL SHUTOFF VALVE ADAPTER FROM FUEL SHUTOFF VALVE.
   - Remove adapter (2) from shutoff valve (3). Use 13/16 inch open end wrench.
   - Plug shutoff valve and cap adapter.



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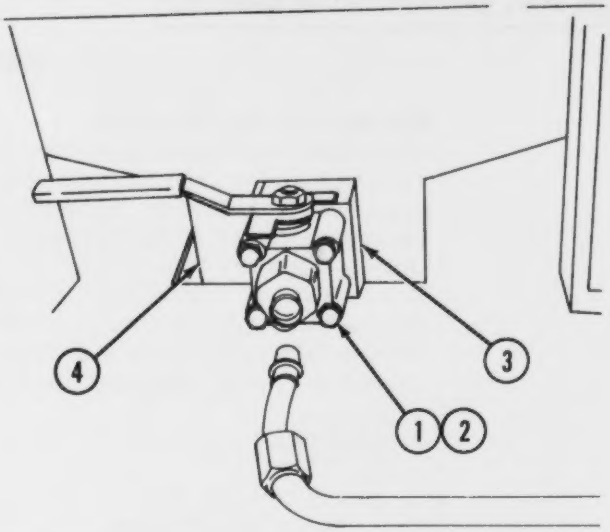
## C. FUEL SHUTOFF VALVE REMOVAL — Continued

3. REMOVE FUEL SHUTOFF VALVE FROM FUEL TANK WELDMENT.
   - Remove four screws (1), lock washers (2), and shutoff valve (3) from fuel tank (4). Use 7/16 inch socket with 2 inch extension and ratchet handle. Discard lock washers.
   - Plug fuel tank and shutoff valve.



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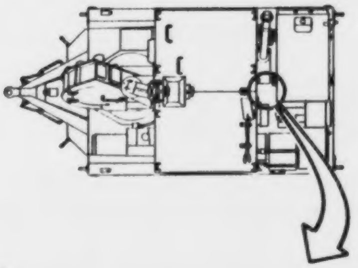
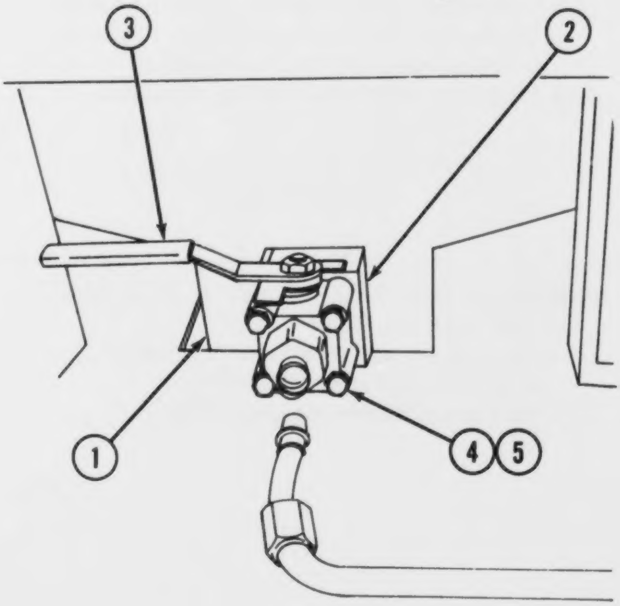
## D. FUEL SHUTOFF VALVE INSTALLATION

**WARNING**

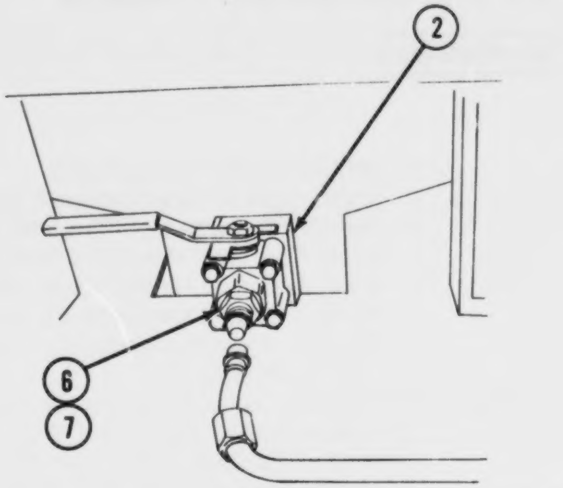
Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

1. INSTALL FUEL SHUTOFF VALVE ON FUEL TANK WELDMENT.
   - Remove plugs from fuel tank (1) and shutoff valve (2).
   - Position shutoff valve (2) on fuel tank (1), with handle (3) to left.
   - Install shutoff valve (2), four new lock washers (4), and screws (5) on fuel tank (1). Use 7/16 inch socket with 2 inch extension and ratchet handle.





2. INSTALL FUEL SHUTOFF VALVE ADAPTER ON FUEL SHUTOFF VALVE.
   - Remove cap from adapter (6).
   - Apply sealing compound to adapter threads (7).
   - Install adapter (6) on shutoff valve (2). Use 13/16 inch open end wrench.



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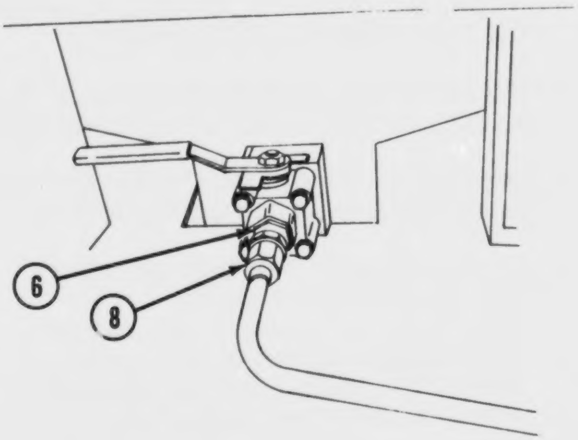
3. CONNECT SUCTION LINE TUBE ASSEMBLY TO FUEL SHUTOFF VALVE ADAPTER.
   - Remove plug and cap from tube assembly (8) and adapter (6).
   - Connect tube assembly (8) to adapter (6). Use 13/16 inch open end and 11/16 inch box and open end box wrenches.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable in Storage Cabinet. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

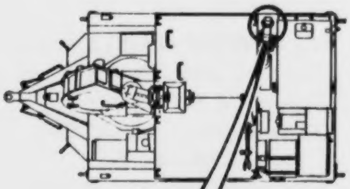
## 13-4 FUEL TANK ASSEMBLY — Continued

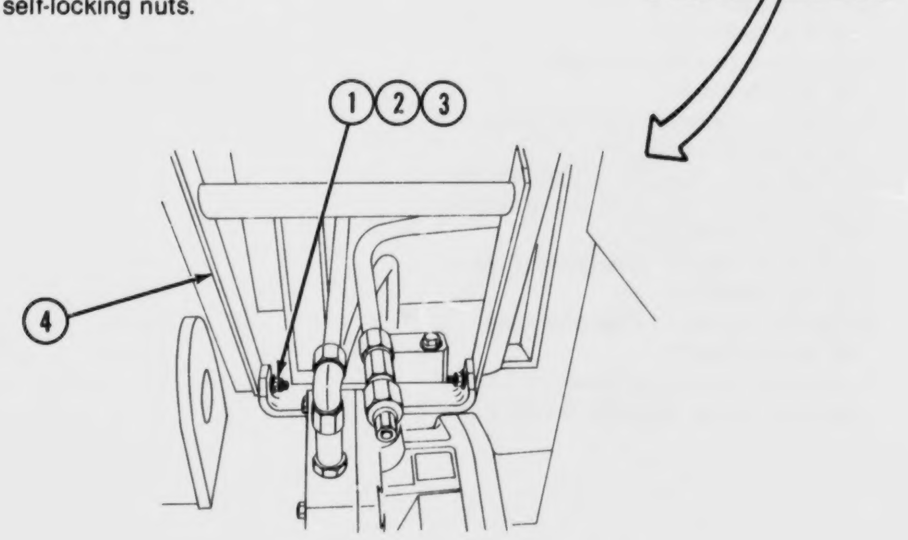
### E. REMOVAL

**NOTE**

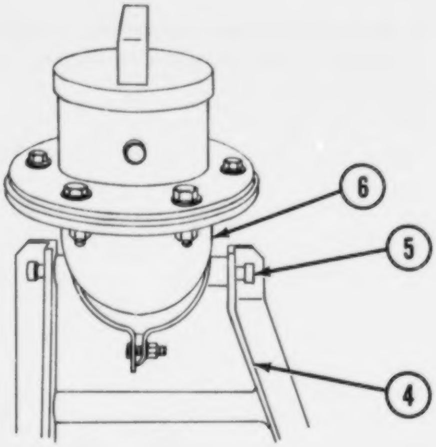
***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)
Remove Engine Hinged Panel. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. DISCONNECT LEAD 13 ELECTRICAL PLUG CONNECTOR FROM FUEL LEVEL TRANSMITTER. (SEE FUEL TANK ASSEMBLY, PAGE 13-4.)
2. REMOVE RETURN TO TANK FROM PALLET SUCTION LINE TUBE ASSEMBLY FROM DISPENSER. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-19.)
3. REMOVE FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY FROM DISPENSER. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-19.)
4. REMOVE FILL NECK SUPPORT ASSEMBLY FROM FILL NECK EXTENSION.
   - Remove two self-locking nuts (1), washers (2), and screws (3) from fill neck support assembly (4). Use two 9/16 inch open end wrenches. Discard self-locking nuts.





- Remove two screws (5) and fill neck support assembly (4) from fill neck extension (6). Use 1/4 inch hex key.



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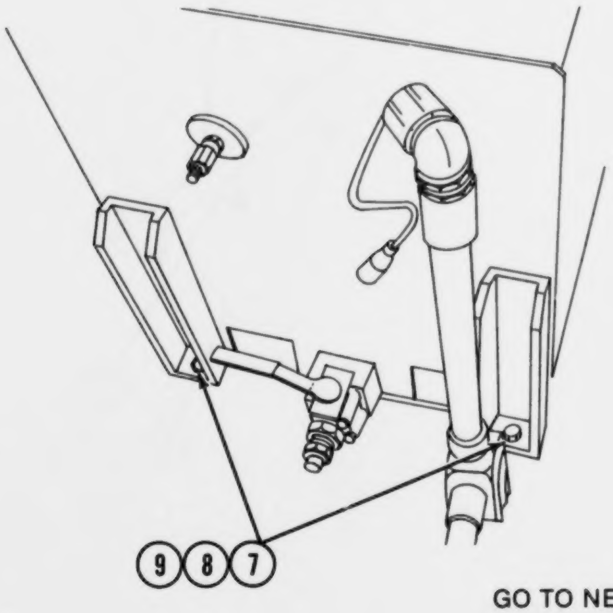
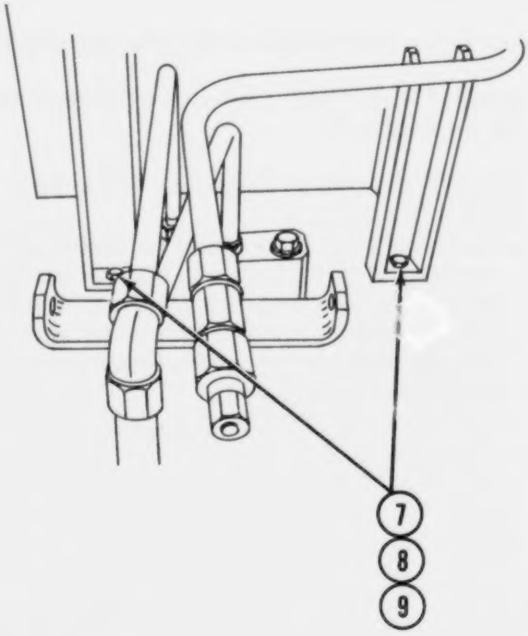
**WARNING**

Dirt and dispenser fluids may hurt your eyes. Wear goggles when working under the chassis.

5. REMOVE FUEL TANK ASSEMBLY FROM CHASSIS.
   - Remove self-locking nuts (7), washers (8), and screws (9) from chassis. Use 9/16 inch box end wrench and 9/16 inch socket with 10 inch extension and 3/8 inch drive ratchet handle. Use helper. Discard self-locking nuts.





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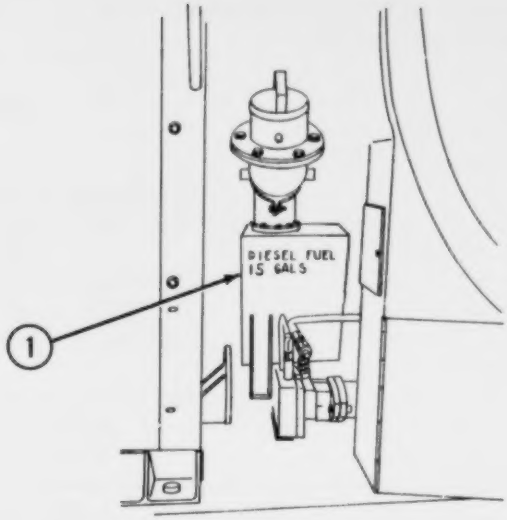
### E. REMOVAL — Continued

- Remove fuel tank assembly (1) from chassis. Use pry bar. Use helper.



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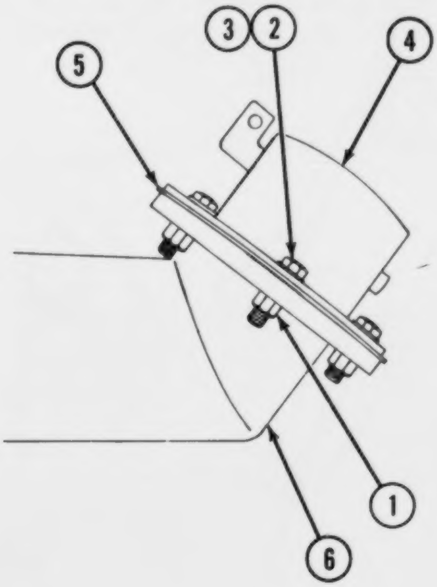
## F. DISASSEMBLY

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

1. REMOVE FUEL TANK CAP AND STRAINER ASSEMBLY AND VENT FROM FUEL TANK. (SEE TM 9-1095-205-20.)

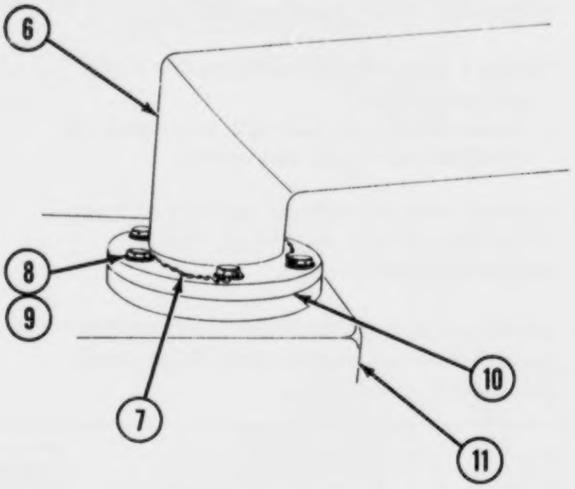
2. REMOVE FILL NECK ASSEMBLY FROM FILL NECK EXTENSION.
   - Remove six self-locking nuts (1), screws (2), washers (3), fill neck (4), and fill neck gasket (5) from fill neck extension (6). Use 9/16 inch box end wrench and 9/16 inch socket with 3/8 inch drive ratchet handle. Discard self-locking nuts and gasket.



**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

3. REMOVE FILL NECK EXTENSION FROM FUEL TANK WELDMENT.
   - Remove safety wire (7) from six screws (8). Use diagonal cutting pliers. Discard safety wire.
   - Remove six screws (8), washers (9), fill neck extension (6), and fill neck extension gasket (10) from fuel tank weldment (11). Use 9/16 inch socket with 3/8 inch drive ratchet handle. Discard gasket.

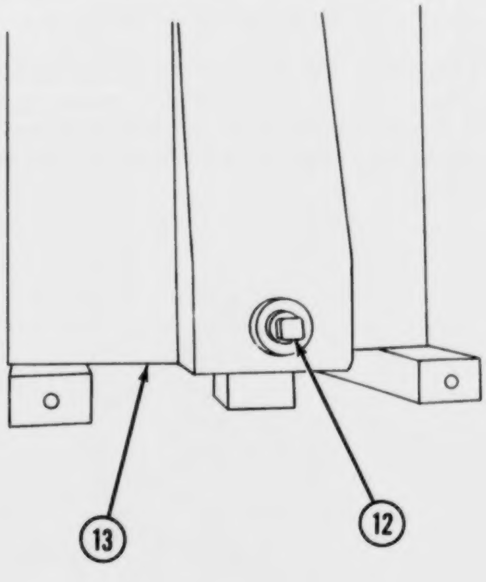


4. REMOVE FUEL LEVEL TRANSMITTER FROM FUEL TANK WELDMENT. (SEE FUEL TANK ASSEMBLY, PAGE 13-4.)

5. REMOVE FUEL SHUTOFF VALVE FROM FUEL TANK WELDMENT. (SEE FUEL TANK ASSEMBLY, PAGE 13-8.)

---

6. REMOVE SQUARE HEAD PLUG FROM FUEL TANK WELDMENT.
   - Remove plug (12) from fuel tank weldment (13). Use 9/16 inch open end wrench.



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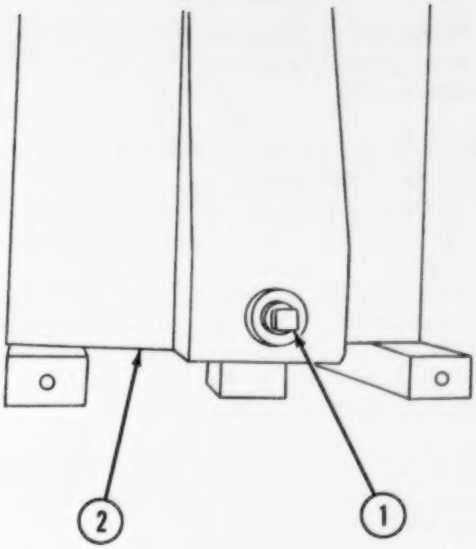
## 13-4 FUEL TANK ASSEMBLY — Continued

### G. REASSEMBLY

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

1. INSTALL SQUARE HEAD PLUG ON FUEL TANK WELDMENT.
   - Install plug (1) on fuel tank weldment (2). Use 9/16 inch open end wrench.
2. INSTALL FUEL SHUTOFF VALVE ON FUEL TANK WELDMENT. (SEE FUEL TANK ASSEMBLY, PAGE 13-8.)
3. INSTALL FUEL LEVEL TRANSMITTER ON FUEL TANK WELDMENT. (SEE FUEL TANK ASSEMBLY, PAGE 13-5.)



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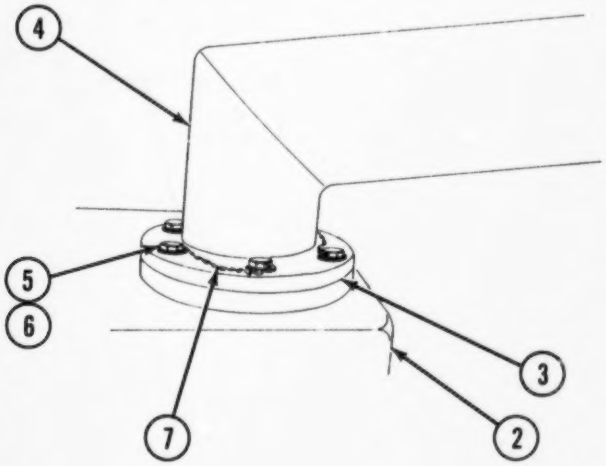
**WARNING**

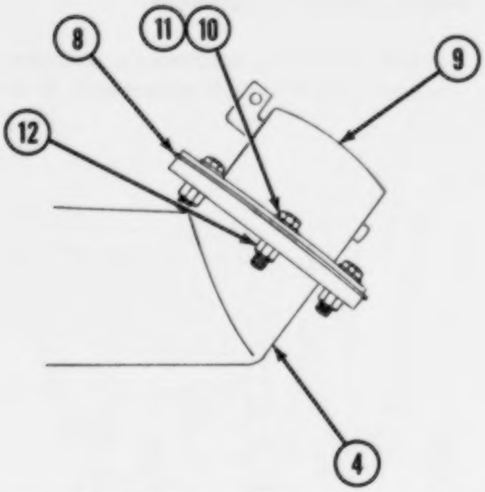
Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

4. INSTALL FILL NECK EXTENSION ON FUEL TANK WELDMENT.
   - Install new fill neck extension gasket (3), fill neck extension (4), six washers (5), and screws (6) on fuel tank weldment (2). Use 9/16 inch socket with 3/8 inch drive ratchet handle.
   - Install new safety wire (7) on six screws (6). Use slip joint pliers.



5. INSTALL FILL NECK ASSEMBLY ON FILL NECK EXTENSION.
   - Install new fill neck gasket (8), fill neck (9), six washers (10), screws (11), and new self-locking nuts (12) on fill neck extension (4). Use 9/16 inch box end wrench and 9/16 inch socket with 3/8 inch drive ratchet handle.

6. INSTALL FUEL TANK CAP AND STRAINER ASSEMBLY AND VENT ON FUEL TANK. (SEE TM 9-1095-205-20.)



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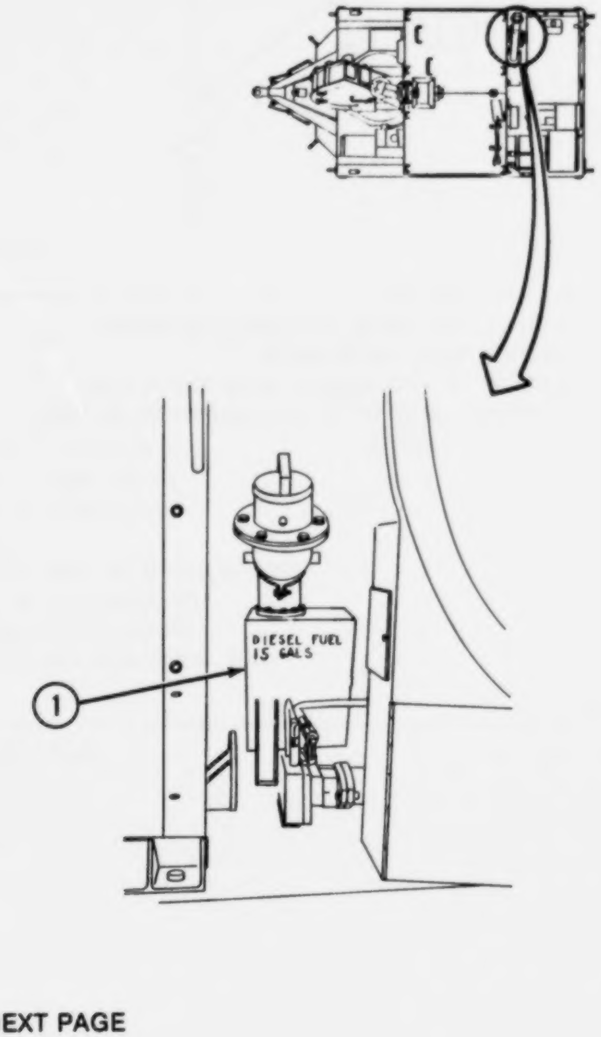
**H. INSTALLATION**

**WARNING**

Dirt and dispenser fluids may hurt your eyes. Wear goggles when working under the chassis.

1. INSTALL FUEL TANK ASSEMBLY ON CHASSIS.
   - Position fuel tank assembly (1) on chassis, with mounting holes alined. Use helper.



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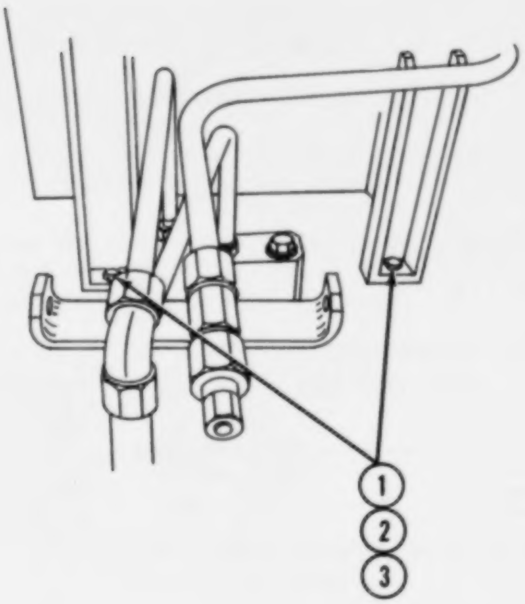
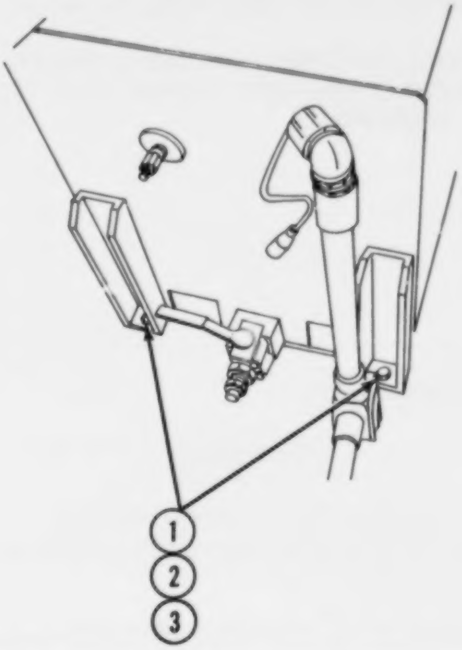
## H. INSTALLATION — Continued

- Install screws (1), washers (2), and new self-locking nuts (3) on chassis. Use 9/16 inch box end wrench and 9/16 inch socket with 10 inch extension and 3/8 inch drive ratchet handle. Use helper.





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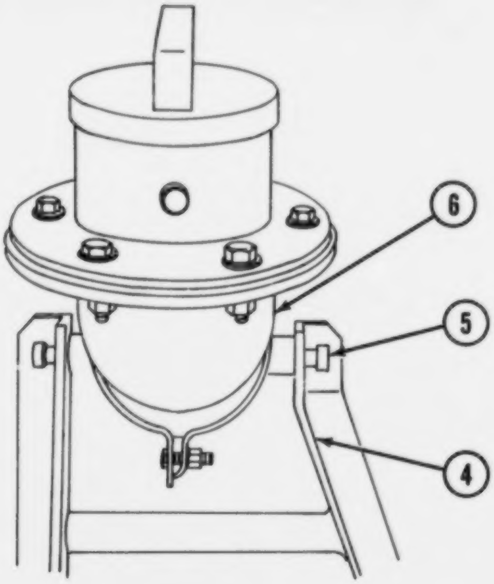
2. INSTALL FILL NECK SUPPORT ASSEMBLY ON FILL NECK EXTENSION.
   - Install fill neck support assembly (4) and two screws (5) on fill neck extension (6). Use 1/4 inch hex key.

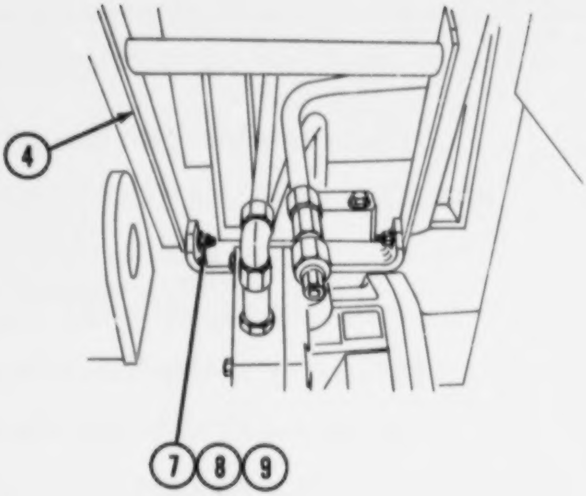


- Install two screws (7), washers (8), and new self-locking nuts (9) on fill neck support assembly (4). Use two 9/16 inch open end wrenches.

3. INSTALL FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY ON DISPENSER. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-19.)

4. INSTALL RETURN TO TANK FROM PALLET SUCTION LINE TUBE ASSEMBLY ON DISPENSER. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-19.)

5. CONNECT LEAD 13 ELECTRICAL PLUG CONNECTOR TO FUEL LEVEL TRANSMITTER. (SEE FUEL TANK ASSEMBLY, PAGE 13-6.)



NOTE

***FOLLOW-ON MAINTENANCE:***
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Install Engine Assembly Top. (See TM 9-1095-205-20.)
Install Engine Hinged Panel. (See TM 9-1095-205-20.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

---

END OF TASK

## 13-5 FUEL SYSTEM LINES AND FITTINGS

**DESCRIPTION**

This task covers:

A. FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY REMOVAL (p 13-20)
B. FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY INSTALLATION (p 13-21)
C. SUCTION LINE MALE CONNECTOR REMOVAL (p 13-22)
D. SUCTION LINE MALE CONNECTOR INSTALLATION (p 13-23)
E. RETURN TO TANK FROM PALLET TUBE ASSEMBLY REMOVAL (p 13-24)
F. RETURN TO TANK FROM PALLET TUBE ASSEMBLY INSTALLATION (p 13-25)
G. RETURN TUBE MALE CONNECTOR AND REDUCER BUSHING REMOVAL (p 13-27)
H. RETURN TUBE MALE CONNECTOR AND REDUCER BUSHING INSTALLATION (p 13-28)

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**INITIAL SETUP**

*Tools and Special Tools:*
General mechanic's tool kit
  5180-00-177-7033:
    9/16 inch open end wrench
    11/16 inch open end wrench
    13/16 inch open end wrench
9/16 inch box and open end box wrench
  5120-00-895-9570
11/16 inch box and open end box wrench
  5120-00-895-9572
Cap and plug set 5340-00-450-5718

*Materials/Parts:*
Sealing compound, Item 25, Appendix B

*References:*
TM 9-1095-205-10
TM 9-1095-205-20

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

---

**OVERVIEW**

Fuel lines have fuel in them. Loosen hose couplings or tube nuts slowly. Catch fuel with rags or in suitable container. Wipe up spilled fuel. Dispose of drained fuel according to local procedures.

GO TO NEXT PAGE

**OVERVIEW — Continued**

Seal fluid line fittings. Nonflared fittings, or fittings without seal, gasket, preformed packing, or other sealing hardware, need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

If you remove or disconnect more than one tube assembly or hose assembly, tag and mark each one. Remove tags after installing or connecting tube assemblies or hose assemblies.

Tube assemblies are not supplied as parts. If you need a new tube assembly, see Appendix C and make one. See:
9290449 fuel tank to pallet suction line tube assembly.
9290450 return to tank from pallet tube assembly.

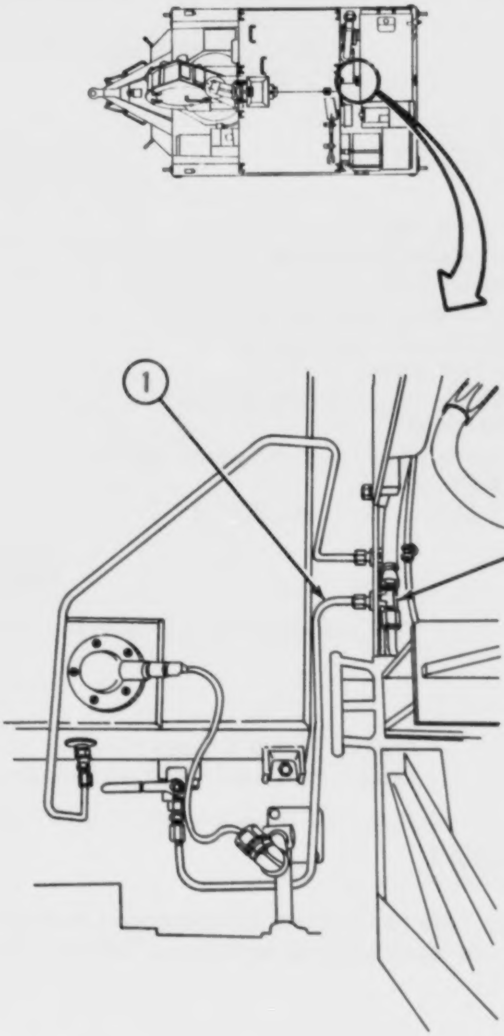
---

## A. FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY REMOVAL

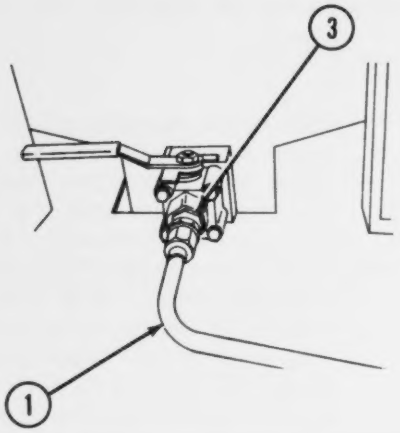
**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)

1. DISCONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY FROM BULKHEAD TEE.
   - Disconnect tube (1) from tee (2). Use 11/16 inch box and open end box wrench.
   - Plug tube, and cap tee.



2. DISCONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY FROM MALE CONNECTOR.
   - Disconnect tube (1) from connector (3). Use 11/16 inch box and open end box and 13/16 inch open end wrenches.
   - Plug tube, and cap connector.
   - Remove tube (1) from dispenser.



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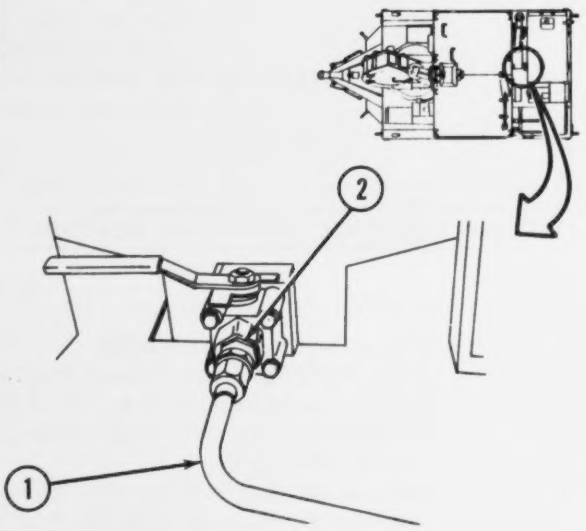
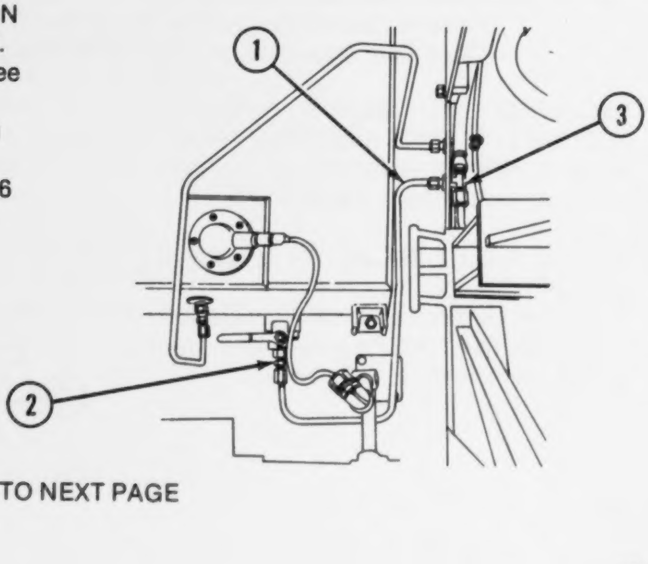
## B. FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY INSTALLATION

1. CONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY TO MALE CONNECTOR.
   - Remove plug and cap from tube (1) and connector (2).
   - Connect tube (1) to connector (2). Use 11/16 inch box and open end box wrench. Do not tighten if connecting both ends of tube.



2. CONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY TO BULKHEAD TEE.
   - Remove plug and cap from tube (1) and tee (3).
   - Connect tube (1) to tee (3). Use 11/16 inch box and open end box wrench.
   - Tighten tube (1) at connector (2). Use 11/16 inch box and open end box wrench.



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## B. FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY INSTALLATION — Continued

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Place Operator Control Box In Checkout Position. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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## C. SUCTION LINE MALE CONNECTOR REMOVAL

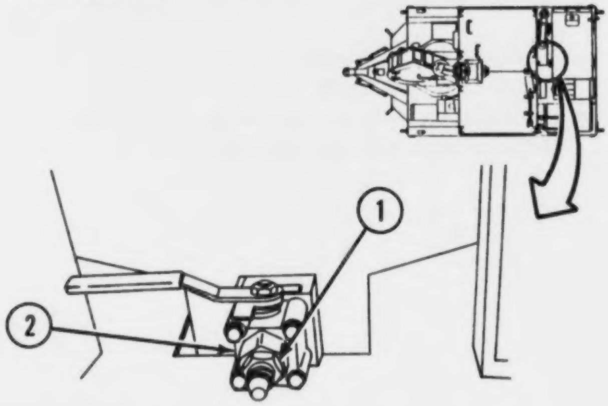
**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

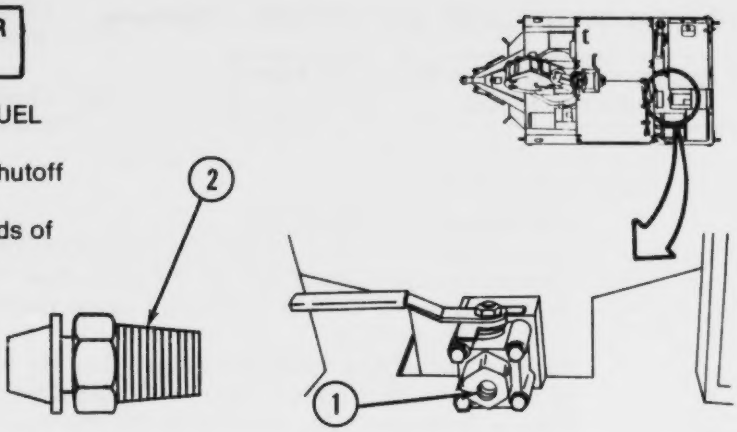
1. DISCONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY FROM MALE CONNECTOR. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-21.)

2. REMOVE MALE CONNECTOR FROM FUEL SHUTOFF VALVE.
   - Remove connector (1) from fuel shutoff valve (2). Use 13/16 inch open end wrench.
   - Plug valve, and cap connector.

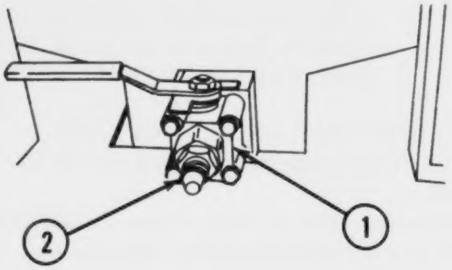


## D. SUCTION LINE MALE CONNECTOR INSTALLATION

1. INSTALL MALE CONNECTOR ON FUEL SHUTOFF VALVE.
   - Remove plug and cap from fuel shutoff valve (1) and connector (2).
   - Apply sealing compound to threads of connector (2).



- Install connector (2) on fuel shutoff valve (1). Use 13/16 inch open end wrench.



2. CONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY TO MALE CONNECTOR. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-21.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Place Operator Control Box In Checkout Position. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

## 13-5 FUEL SYSTEM LINES AND FITTINGS — Continued

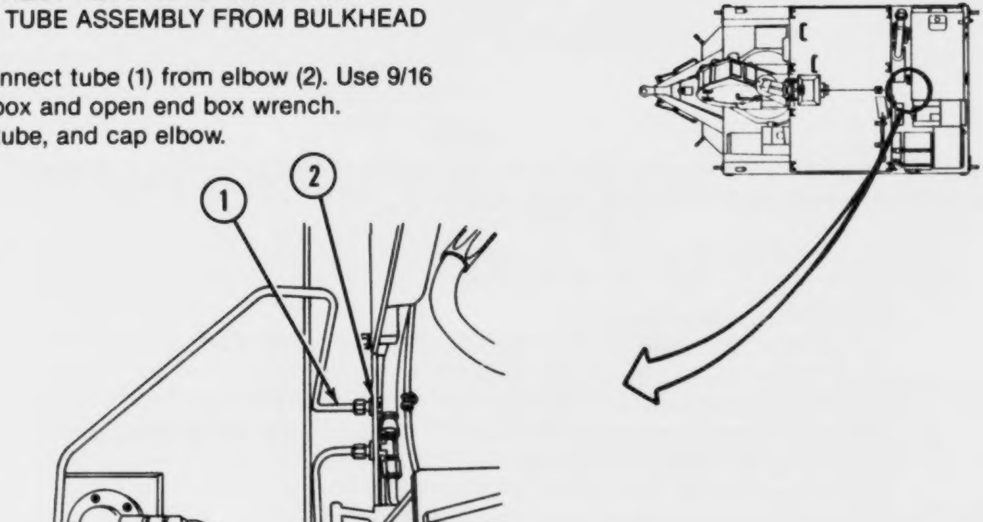
### E. RETURN TO TANK FROM PALLET TUBE ASSEMBLY REMOVAL

**NOTE**

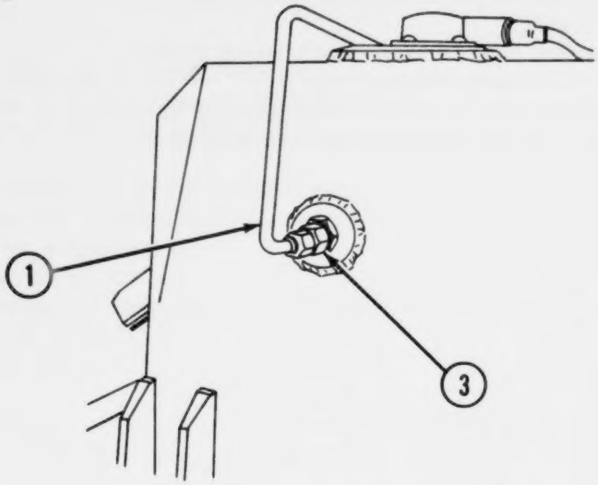
***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY FROM BULKHEAD ELBOW.
   - Disconnect tube (1) from elbow (2). Use 9/16 inch box and open end box wrench.
   - Plug tube, and cap elbow.



2. DISCONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY FROM MALE CONNECTOR.
   - Disconnect tube (1) from connector (3). Use 9/16 inch box and open end box and 9/16 inch open end wrenches.
   - Plug tube, and cap connector.
   - Remove tube (1) from dispenser.



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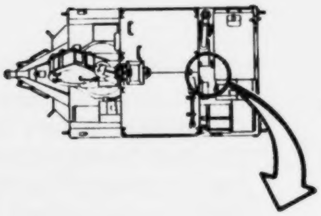
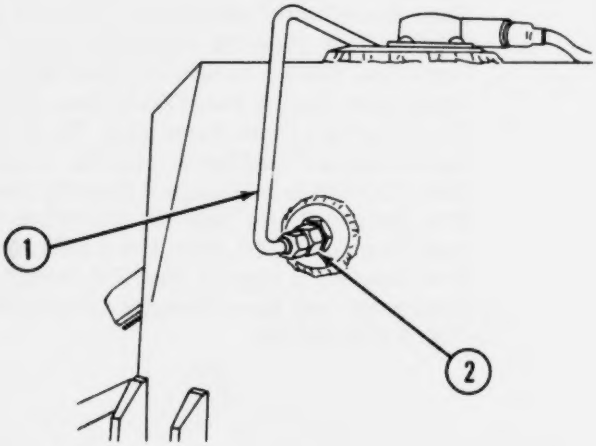
## F. RETURN TO TANK FROM PALLET TUBE ASSEMBLY INSTALLATION

1. CONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY TO MALE CONNECTOR.
   - Remove plug and cap from tube (1) and connector (2).
   - Connect tube (1) to connector (2). Use 9/16 inch box and open end box wrench. Do not tighten if connecting both ends of tube.





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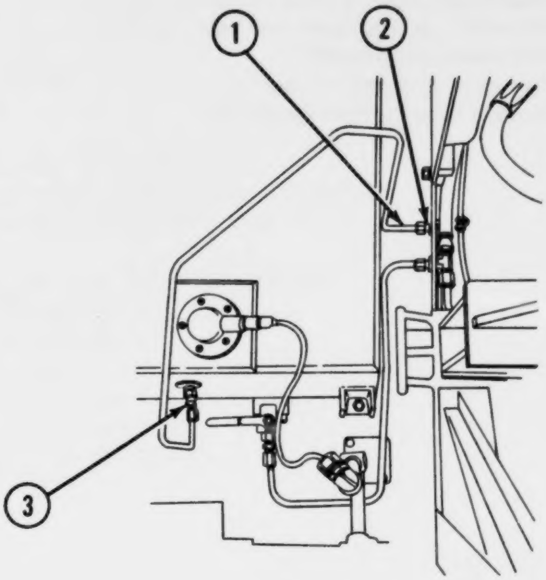
## F. RETURN TO TANK FROM PALLET TUBE ASSEMBLY INSTALLATION — Continued

2. CONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY TO BULKHEAD ELBOW.
   - Remove plug and cap from tube (1) and elbow (2).
   - Connect tube (1) to elbow (2). Use 9/16 inch box and open end box wrench.
   - Tighten tube (1) at male connector (3). Use 9/16 inch box and open end box wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Place Operator Control Box In Checkout Position. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

## G. RETURN TUBE MALE CONNECTOR AND REDUCER BUSHING REMOVAL

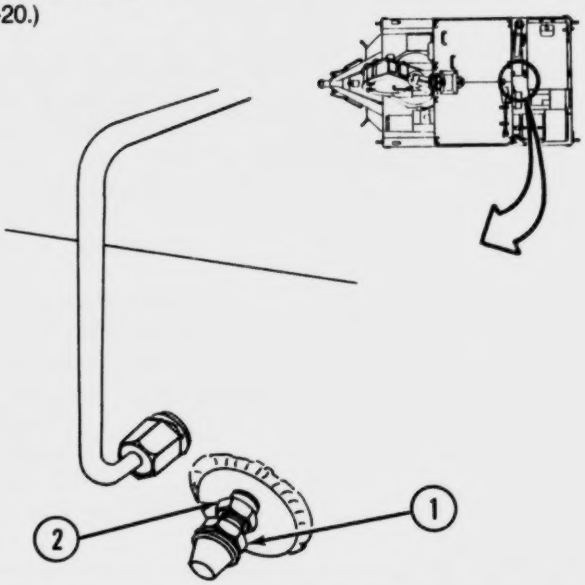
**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY FROM MALE CONNECTOR. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-25.)

2. REMOVE MALE CONNECTOR FROM REDUCER BUSHING.
   - Remove connector (1) from bushing (2). Use 9/16 inch open end wrench.
   - Plug bushing, and cap connector.



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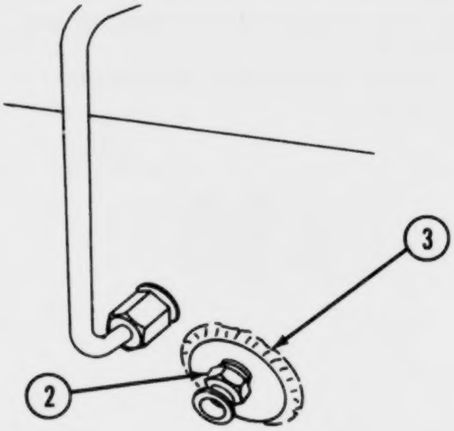
3. REMOVE REDUCER BUSHING FROM FUEL TANK.
   - Remove bushing (2) from fuel tank (3). Use 11/16 inch open end wrench.
   - Plug tank, and cap bushing.



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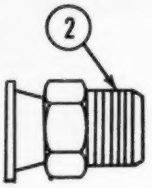
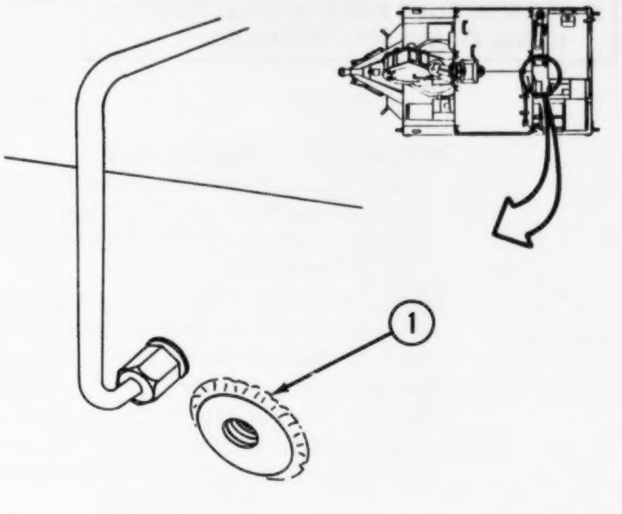
## 13-5 FUEL SYSTEM LINES AND FITTINGS — Continued

### H. RETURN TUBE MALE CONNECTOR AND REDUCER BUSHING INSTALLATION

1. INSTALL REDUCER BUSHING ON FUEL TANK.
   - Remove plug and cap from tank (1) and bushing (2).
   - Apply sealing compound to threads of bushing (2).





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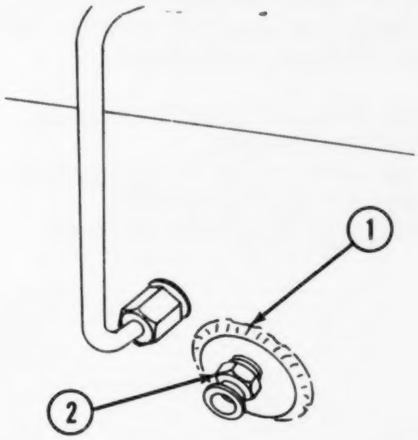
   - Install bushing (2) on fuel tank (1). Use 11/16 inch open end wrench.



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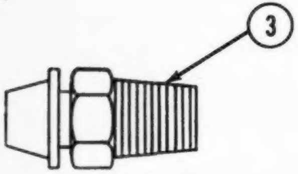
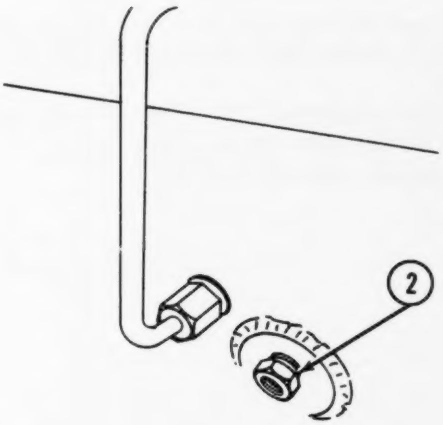
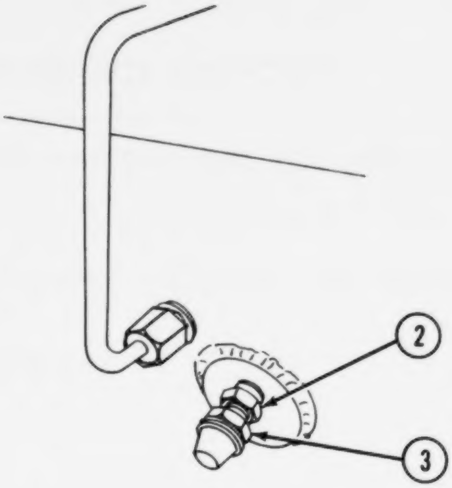
2. INSTALL MALE CONNECTOR ON REDUCER BUSHING.
   - Remove plug and cap from bushing (2) and connector (3).
   - Apply sealing compound to threads of connector (3).





- Install connector (3) on bushing (2). Use 9/16 inch open end wrench.

3. CONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY TO MALE CONNECTOR. (SEE FUEL SYSTEM LINES AND FITTINGS, PAGE 13-25.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Place Operator Control Box In Checkout Position. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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END OF TASK

# CHAPTER 14

# COOLANT HEATER INSTALLATION (DIRECT SUPPORT)

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## Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

### 14-1 COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

### 14-2 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are authorized for the M128 Ground Vehicle Mine Dispenser.

### 14-3 REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list TM 9-1095-205-34P, covering direct support and general support maintenance for this equipment.

## Section II. MAINTENANCE PROCEDURES

### 14-4 FUEL BURNING HEATER

**DESCRIPTION**

This task covers:

A. COVER ASSEMBLY REMOVAL (p 14-4)
B. COVER ASSEMBLY INSTALLATION (p 14-4)
C. LIMIT SWITCH REMOVAL (p 14-5)
D. LIMIT SWITCH INSTALLATION (p 14-6)
E. IGNITER REMOVAL (p 14-6)
F. IGNITER INSTALLATION (p 14-7)
G. FLAME SWITCH ASSEMBLY REMOVAL (p 14-7)
H. FLAME SWITCH ASSEMBLY DISASSEMBLY (p 14-8)
I. FLAME SWITCH ASSEMBLY REASSEMBLY (p 14-9)
J. FLAME SWITCH ASSEMBLY INSTALLATION (p 14-10)
K. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY REMOVAL (p 14-10)
L. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY DISASSEMBLY (p 14-13)
M. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY REASSEMBLY (p 14-16)
N. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY INSTALLATION (p 14-18)
O. FUEL BURNING HEATER DISASSEMBLY (p 14-20)
P. FUEL BURNING HEATER REASSEMBLY (p 14-26)
Q. FLAME SWITCH ASSEMBLY ADJUSTMENT (p 14-32)
R. THERMOSTAT TEST (p 14-33)

**INITIAL SETUP**

***Tools and Special Tools:***

- General mechanic's tool kit 5180-00-177-7033:
  - 1/4 inch flat tip screwdriver
  - 3/8 inch flat tip screwdriver
  - Ratchet handle
  - 3/8 inch open end wrench
  - 3/8 inch box end wrench
  - 1/2 inch open end wrench
  - 5/16 inch box end wrench
  - 7/16 inch open end wrench
  - 7/16 inch box end wrench
  - Round nose pliers
  - 6 inch adjustable wrench (2)
  - 3/32 inch hex key
- 1/2 inch drive 7/8 inch deep socket 5120-00-243-7342
- Hose clamp pliers 5120-00-537-3375
- 1/4 inch drive speeder handle 5120-00-242-3256

***Tools and Special Tools — Continued:***

- 1/4 inch drive 5/16 inch socket 5120-00-235-5878
- Cap and plug set 5340-00-450-5718

***Test Equipment:***

- Suitable container
- 6 foot rubber hose (2) (19200) 9290777
- Hose clamp (2) 4730-00-908-3193
- Slave cable 2590-00-148-7961
- Thermometer 6685-00-526-8122
- 24 V dc power supply 6625-00-841-8917

***Materials/Parts:***

- Antifreeze coolant, Item 3, Appendix B
- Sealing compound, Item 26, Appendix B
- Gasket 5935-00-768-7042
- Nut with captive washer (2) 5310-00-237-5016
- Nut with captive washer (2) 5310-00-903-2710

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

| *Materials/Parts — Continued:* | *References:* |
|---|---|
| Screw with captive washer (8) 5305-00-749-5278 | TM 9-1095-205-10 |
| Screw with captive washer (19) 5305-01-135-7625 | TM 9-1095-205-20 |
| Screw with captive washer (2) 5305-01-030-7344 | |

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## OVERVIEW

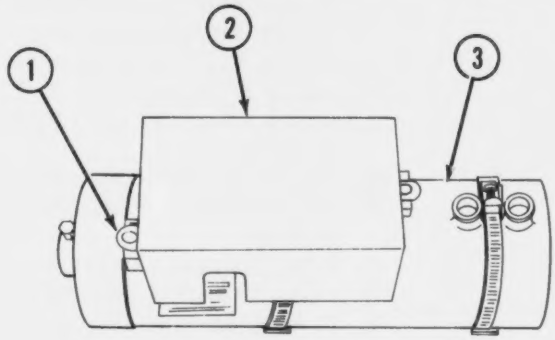
Seal fluid line fittings. Nonflared fittings or fittings without seal, gasket, preformed packing, or other sealing hardware need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

---

## A. COVER ASSEMBLY REMOVAL

REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER.

- Loosen two turn lock fasteners (1), and remove cover (2) from heater (3). Use 3/8 inch flat tip screwdriver.



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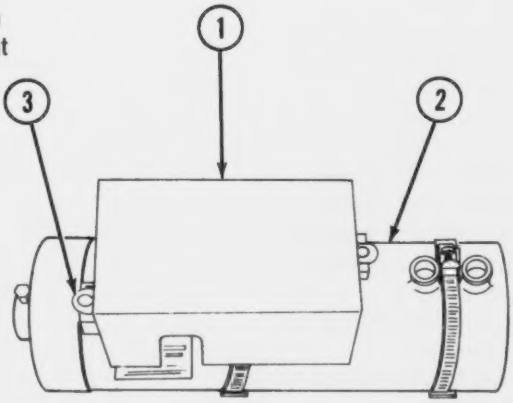
## B. COVER ASSEMBLY INSTALLATION

INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER.

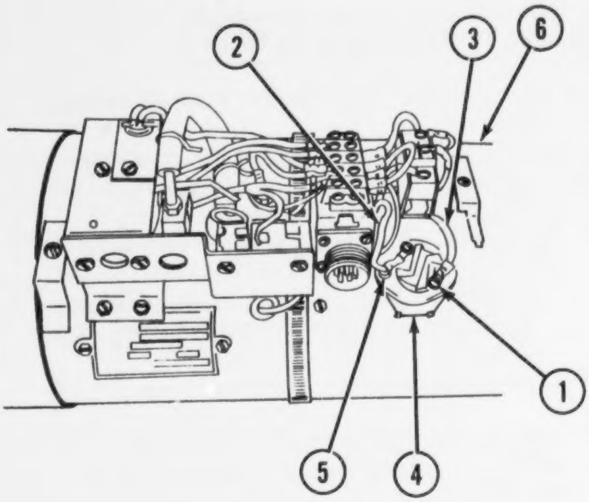
- Position cover (1) on heater (2), and tighten two turn lock fasteners (3). Use 3/8 inch flat tip screwdriver.

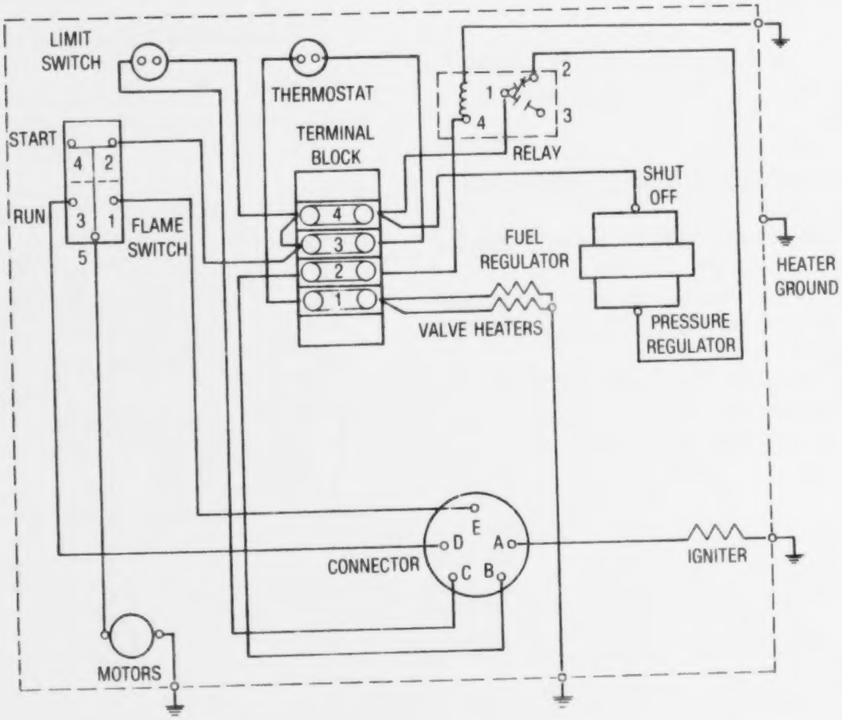


## C. LIMIT SWITCH REMOVAL

1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)

2. REMOVE LIMIT SWITCH FROM FUEL BURNING HEATER.
   - Tag and mark leads. (See following Fuel Burning Heater Wiring Diagram.)
   - Remove two screws (1), connector lead (2), and terminal block lead (3) from limit switch (4). Use 1/4 inch flat tip screwdriver.
   - Remove two screws with captive washers (5) and limit switch (4) from heater (6). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.




LIMIT SWITCH
THERMOSTAT
START
4
2
RUN
3
1
5
FLAME SWITCH
TERMINAL BLOCK
4
3
2
1
1
4
2
3
RELAY
SHUT OFF
FUEL REGULATOR
VALVE HEATERS
PRESSURE REGULATOR
HEATER GROUND
CONNECTOR
E
D
A
C
B
IGNITER
MOTORS

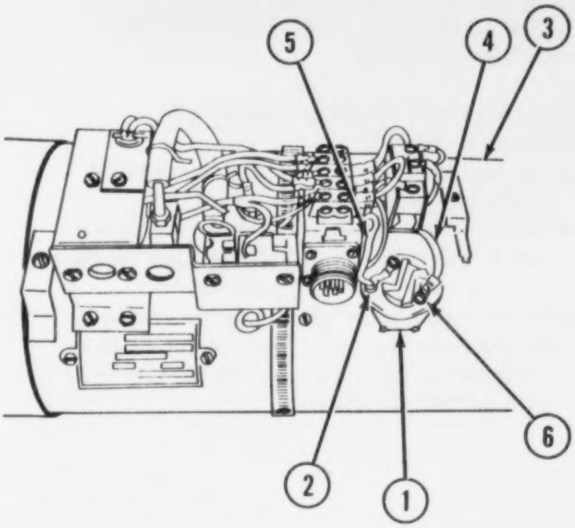
*Fuel Burning Heater Wiring Diagram*

GO TO NEXT PAGE

## 14-4 FUEL BURNING HEATER — Continued

### D. LIMIT SWITCH INSTALLATION

1. INSTALL LIMIT SWITCH ON FUEL BURNING HEATER.
   - Install limit switch (1) and two new screws with captive washers (2) on heater (3). Use 1/4 inch flat tip screwdriver.
   - Install terminal block lead (4), connector lead (5), and two screws (6) on limit switch (1). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tags from leads.
2. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)



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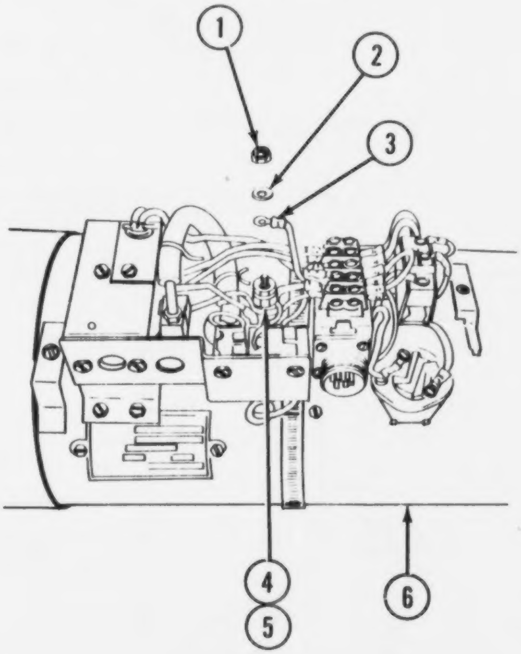
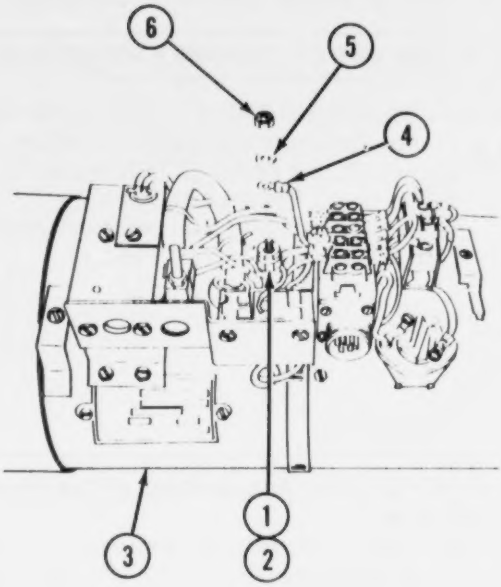
### E. IGNITER REMOVAL

1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)
2. REMOVE IGNITER FROM FUEL BURNING HEATER BURNER.
   - Tag and mark lead. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove nut (1), washer (2), and Connector Lead A (3) from igniter (4). Use 3/8 inch open end wrench.
   - Remove igniter (4) and gasket (5) from burner (6). Use 7/8 inch deep socket with ratchet handle. Discard gasket.
   - Plug burner.



## F. IGNITER INSTALLATION



1. INSTALL IGNITER IN FUEL BURNING HEATER BURNER.
   - Remove plug from burner.
   - Install new gasket (1) and igniter (2) in burner (3). Use 7/8 inch deep socket with ratchet handle.
   - Install Connector Lead A (4), washer (5), and nut (6) on igniter (2). Use 3/8 inch open end wrench. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tag from lead.
2. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)

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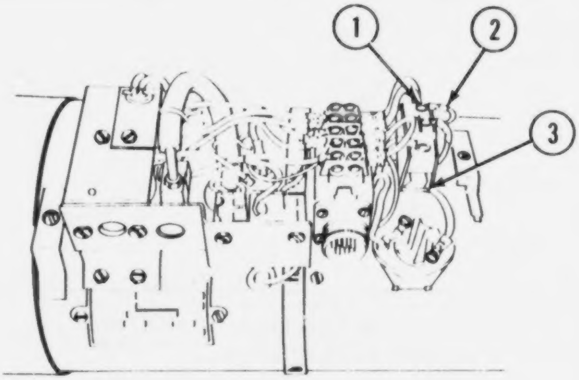
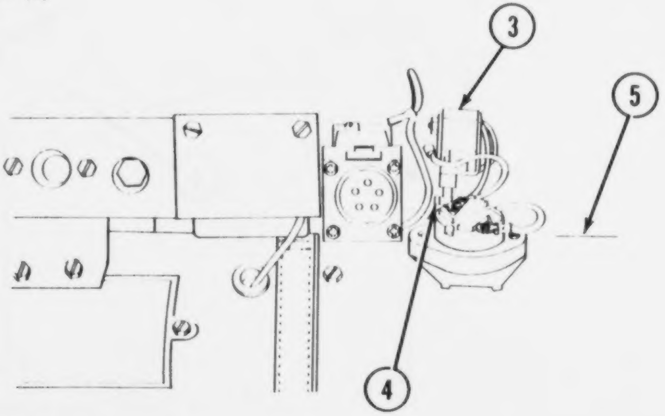
## G. FLAME SWITCH ASSEMBLY REMOVAL



1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)
2. REMOVE FLAME SWITCH ASSEMBLY FROM FUEL BURNING HEATER.
   - Tag and mark leads. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove four screws (1) and leads (2) from flame switch (3). Use 1/4 inch flat tip screwdriver.
   - Loosen nut (4), and remove flame switch (3) from heater (5). Use 1/2 inch open end wrench.
   - Plug heater.



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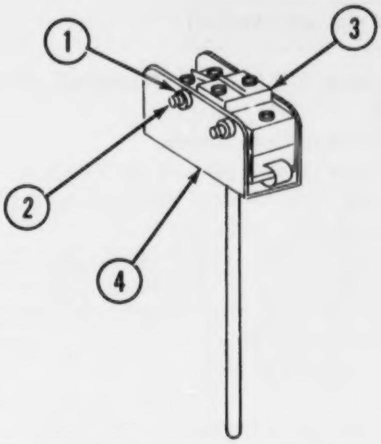
## 14-4 FUEL BURNING HEATER — Continued

### H. FLAME SWITCH ASSEMBLY DISASSEMBLY

1. REMOVE SWITCH FROM FRAME ASSEMBLY.
   - Remove two nuts with captive washers (1), screws (2), and switch (3) from frame assembly (4). Use 1/4 inch flat tip screwdriver and 5/16 inch box end wrench. Discard nuts with captive washers.



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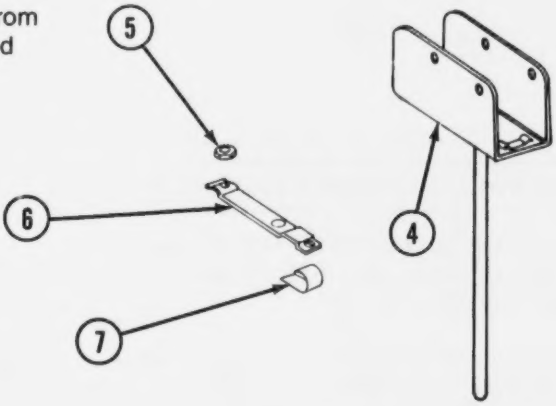
2. REMOVE LEVER AND SPRING FROM FRAME ASSEMBLY.
   - Remove nut (5), lever (6), and spring (7), from frame assembly (4). Use 5/16 inch box end wrench.



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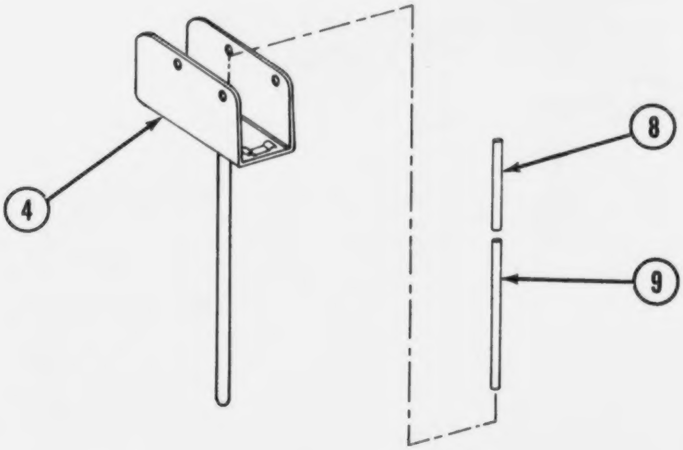
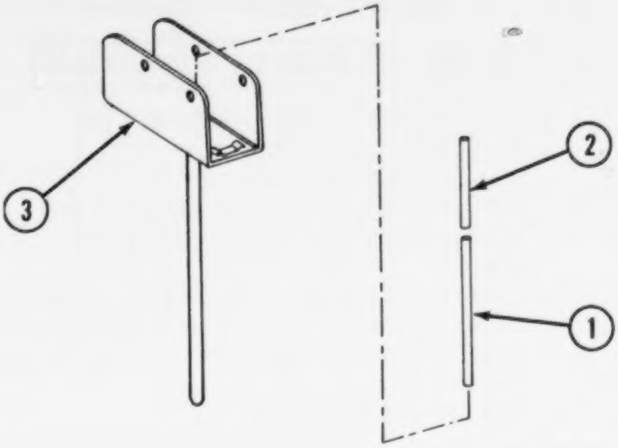
3. REMOVE ROD (8) AND QUARTZ ROD (9) FROM FRAME ASSEMBLY (4).



## I. FLAME SWITCH ASSEMBLY REASSEMBLY

1. INSTALL QUARTZ ROD (1) AND ROD (2) IN FRAME ASSEMBLY (3).



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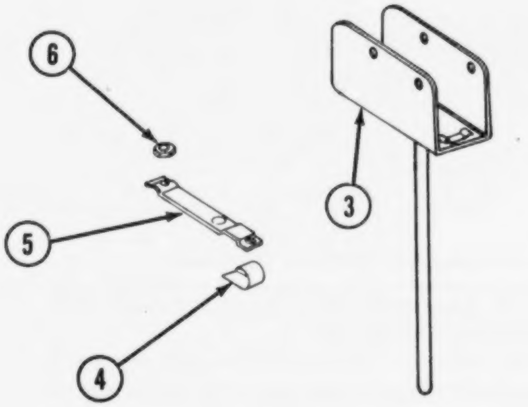
2. INSTALL SPRING AND LEVER ON FRAME ASSEMBLY.
   - Install spring (4), lever (5), and nut (6) on frame assembly (3). Use 5/16 inch box end wrench.



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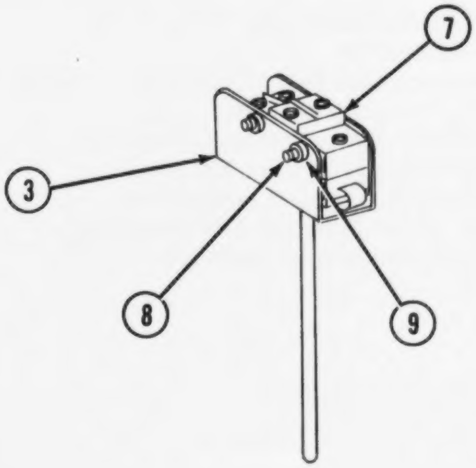
3. INSTALL SWITCH ON FRAME ASSEMBLY.
   - Install switch (7), two screws (8), and new nuts with captive washers (9) on frame assembly (3). Use 1/4 inch flat tip screwdriver and 5/16 inch box end wrench.



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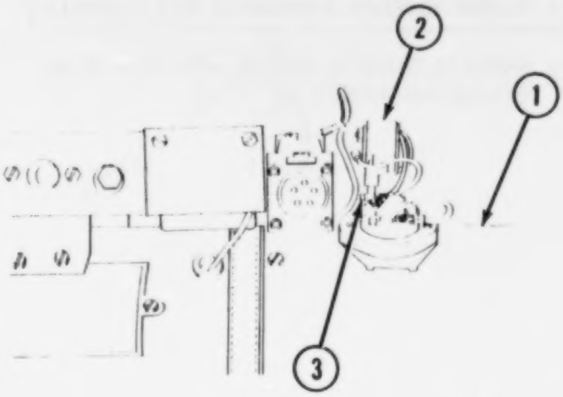
## 14-4 FUEL BURNING HEATER — Continued

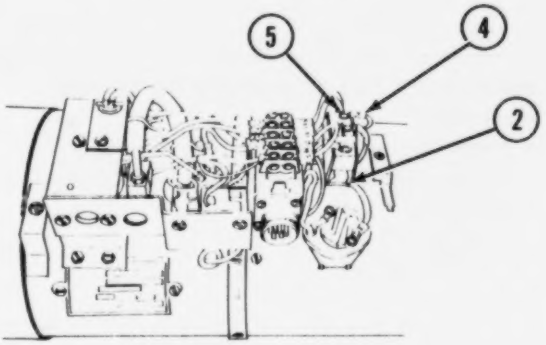
### J. FLAME SWITCH ASSEMBLY INSTALLATION

1. INSTALL FLAME SWITCH ASSEMBLY ON FUEL BURNING HEATER.
   - Remove plug from heater (1).
   - Position flame switch (2) on heater (1), and tighten nut (3). Use 1/2 inch open end wrench.
   - Install four leads (4) and screws (5) on flame switch (2). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tags from leads.

2. ADJUST FLAME SWITCH ASSEMBLY. (SEE FUEL BURNING HEATER, PAGE 14-32.)

3. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)





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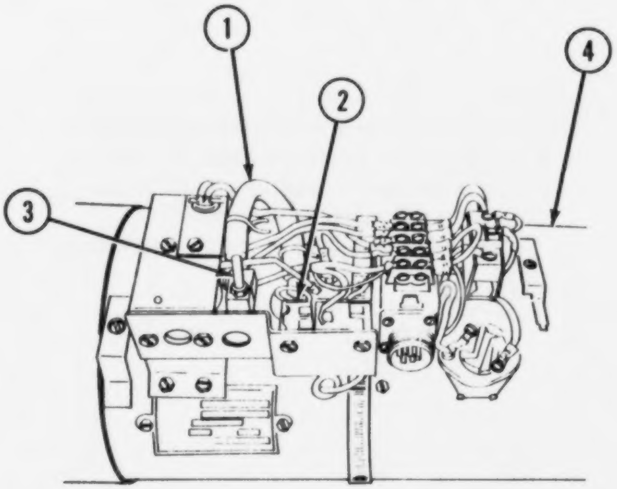
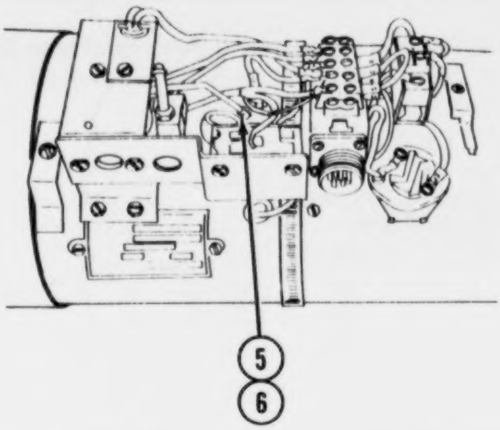
### K. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY REMOVAL

1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)

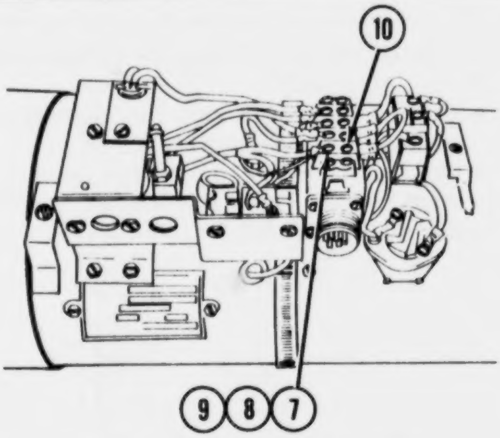
2. REMOVE FUEL LINE HOSE FROM FUEL BURNING HEATER.
   - Disconnect hose (1) from fuel line connector (2). Use hose clamp pliers.
   - Plug hose, and cap fuel line connector.
   - Disconnect hose (1) from fuel tube assembly (3). Use hose clamp pliers.
   - Plug hose, and cap fuel tube assembly.
   - Remove hose (1) from heater (4).



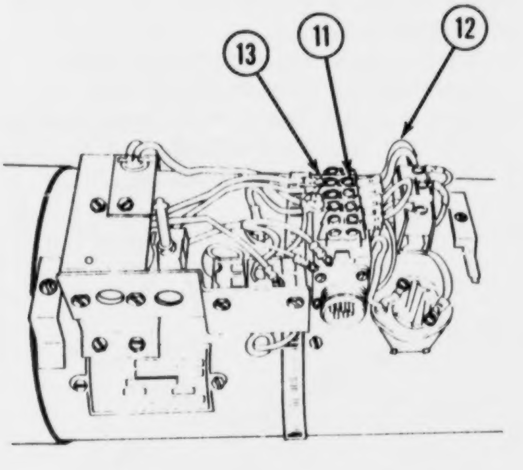
3. REMOVE PRESSURE REGULATOR LEAD FROM RELAY TERMINAL.
   - Tag and mark lead. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove pressure regulator lead (5) from Relay Terminal No. 2 (6).



4. REMOVE REGULATOR SHUTOFF VALVE LEAD AND RELAY LEAD NO. 1 FROM TERMINAL BLOCK.
   - Tag and mark leads. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove screw (7), regulator shutoff valve lead (8), and Relay Lead No. 1 (9) from Terminal Block Terminal No. 4 (10). Use 1/4 inch flat tip screwdriver.



5. REMOVE TWO THERMOSTAT LEADS FROM TERMINAL BLOCK.
   - Tag and mark leads. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove screw (11) and thermostat lead (12) from Terminal Block No. 1 (13). Use 1/4 inch flat tip screwdriver.



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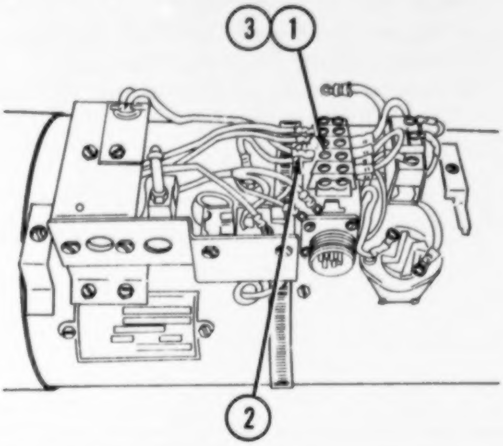
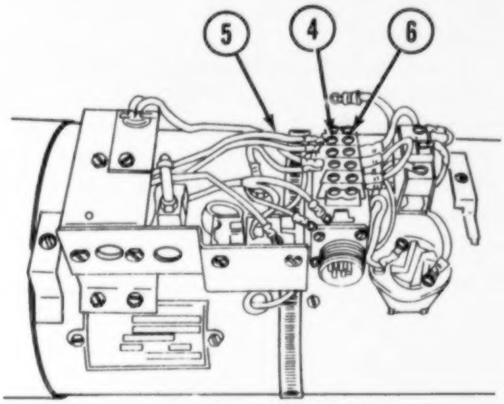
## K. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY REMOVAL — Continued

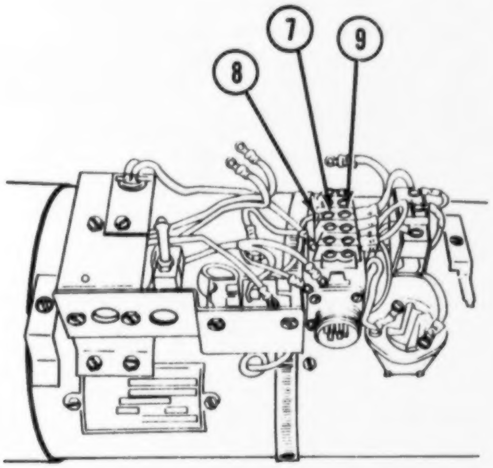
- Remove screw (1) and thermostat lead (2) from Terminal Block Terminal No. 3 (3). Use 1/4 inch flat tip screwdriver.



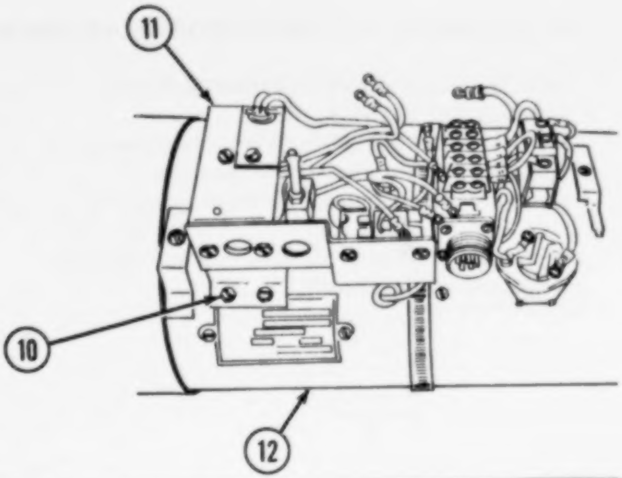
6. REMOVE TWO VALVE HEATER LEADS FROM TERMINAL BLOCK.
   - Tag and mark leads. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove screw (4) and two valve heater leads (5) from Terminal Block Terminal No. 1 (6). Use 1/4 inch flat tip screwdriver.



7. REMOVE RELAY VALVE LEAD NO. 4 FROM TERMINAL BLOCK.
   - Tag and mark lead. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove screw (7) and Relay Valve Lead No. 4 (8) from Terminal Block Terminal No. 2 (9). Use 1/4 inch flat tip screwdriver.



8. REMOVE VALVE BRACKET AND REGULATOR VALVE ASSEMBLY FROM FUEL BURNING HEATER.
   - Remove four screws with captive washers (10) and valve assembly (11) from heater (12). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.



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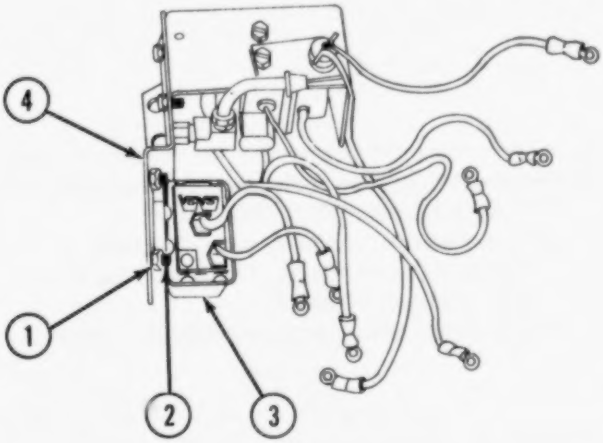
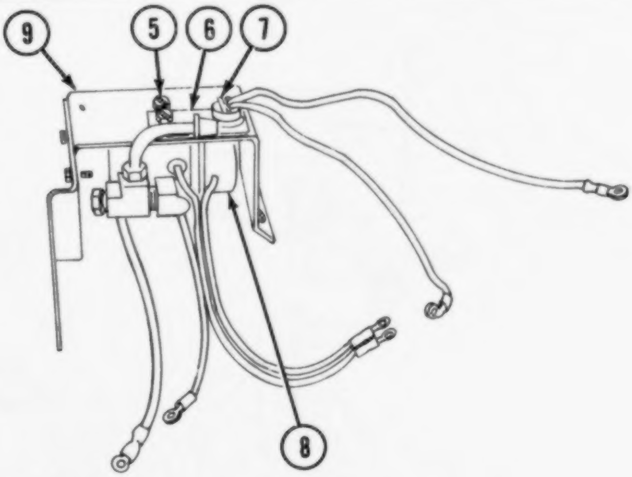
## L. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY DISASSEMBLY

1. REMOVE RELAY FROM RELAY BRACKET.
   - Remove two nuts with captive washers (1), screws with captive washers (2), and relay (3) from relay bracket (4). Use 5/16 inch and 3/8 inch box end wrenches. Discard nuts with captive washers and screws with captive washers.



2. REMOVE REGULATOR VALVE FROM VALVE BRACKET.
   - Remove two screws with captive washers (5), thermostat bracket (6), thermostat (7), and regulator valve (8) from valve bracket (9). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.



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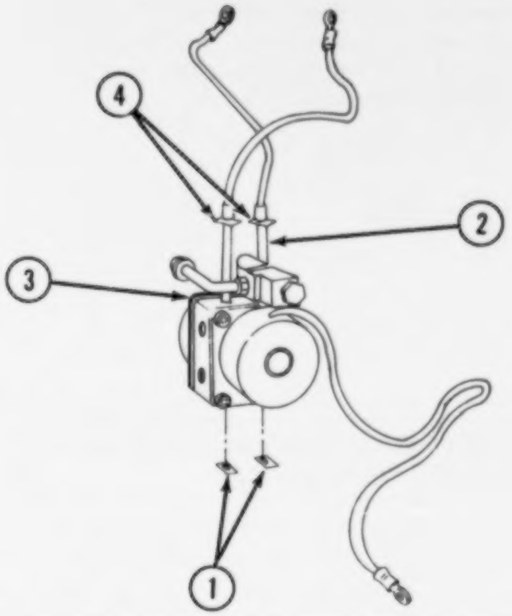
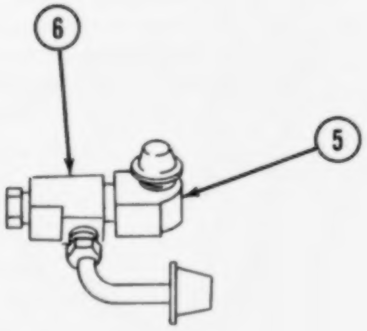
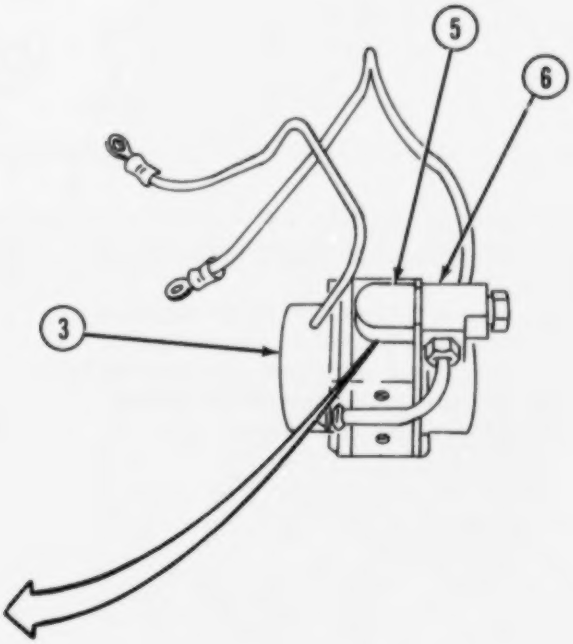
## L. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY DISASSEMBLY — Continued

3. REMOVE TWO VALVE ELEMENTS FROM REGULATOR VALVE.
   - Remove push-on nuts (1) from two elements (2). Use 1/4 inch flat tip screwdriver.
   - Remove two elements (2) from regulator valve (3).
   - Remove push-nuts (4) from two elements (2). Use round nose pliers.

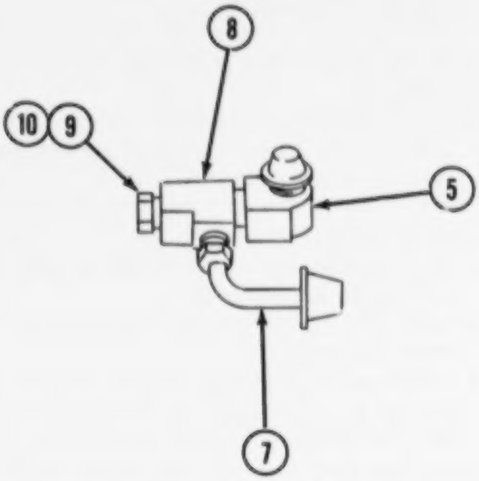


4. REMOVE STREET ELBOW WITH ATTACHED FITTINGS FROM REGULATOR VALVE.
   - Remove street elbow (5) with attached fittings (6) from regulator valve (3). Use 6 inch adjustable wrench.
   - Cap street elbow, and plug regulator valve.





5. DISASSEMBLE TEE ADAPTER.
   - Remove fuel tube assembly (7) from tee adapter (8). Use 7/16 inch open end and 6 inch adjustable wrenches.
   - Plug tee, and cap fuel tube assembly.
   - Remove street elbow (5) from tee adapter (8). Use two 6 inch adjustable wrenches.
   - Plug street elbow, and cap tee adapter.
   - Remove nozzle assembly (9) with special pipe plug (10) from tee adapter (8). Use 7/16 inch box end and 6 inch adjustable wrenches.
   - Plug tee adapter, and cap nozzle assembly.



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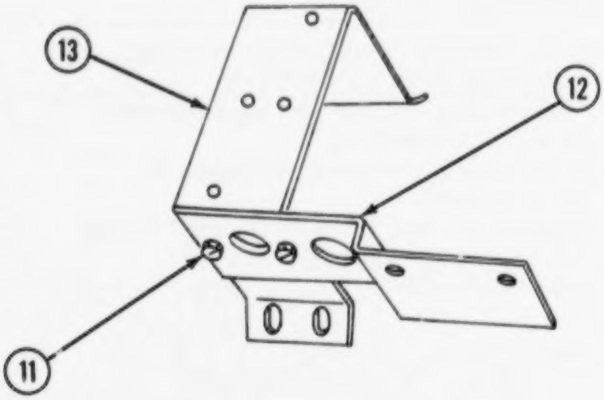
6. REMOVE RELAY BRACKET FROM VALVE BRACKET.
   - Remove two screws with captive washers (11) and relay bracket (12) from valve bracket (13). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.



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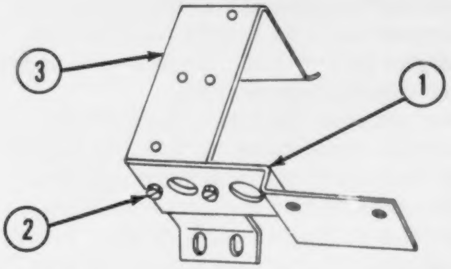
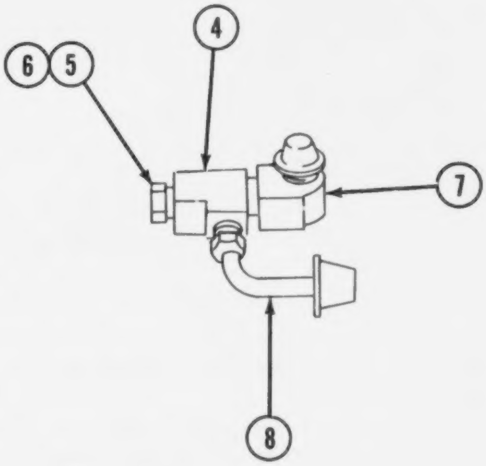
## 14-4 FUEL BURNING HEATER — Continued

### M. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY REASSEMBLY

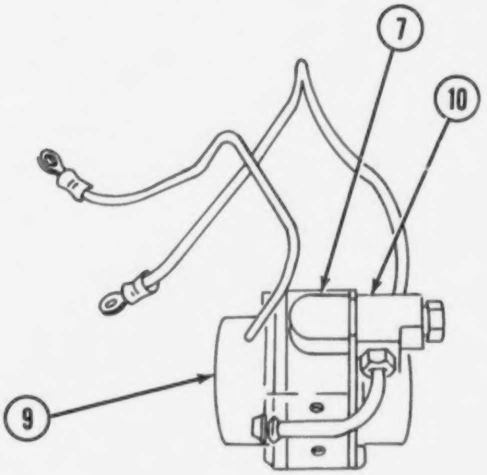
1. INSTALL RELAY BRACKET ON VALVE BRACKET.
   - Install relay bracket (1) and two new screws with captive washers (2) on valve bracket (3). Use 1/4 inch flat tip screwdriver.



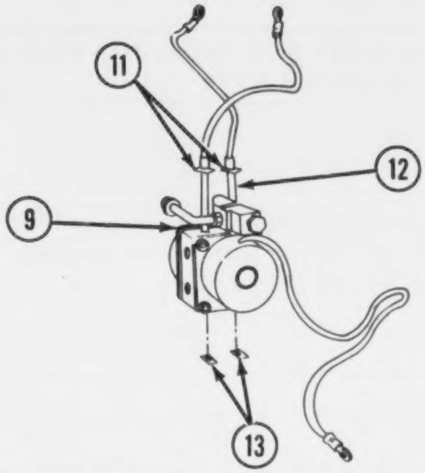
2. REASSEMBLE TEE ADAPTER.
   - Remove plug and cap from tee adapter (4) and nozzle assembly (5).
   - Apply sealing compound to threads of nozzle assembly (5).
   - Install nozzle assembly (5) with special pipe plug (6) on tee adapter (4). Use 7/16 inch box end and 6 inch adjustable wrenches.
   - Remove plug and cap from street elbow (7) and tee adapter (4).
   - Apply sealing compound to threads of tee adapter (4).
   - Install street elbow (7) on tee adapter (4). Use two 6 inch adjustable wrenches.
   - Remove plug and cap from tee adapter (4) and fuel tube assembly (8).
   - Apply sealing compound to threads of fuel tube assembly (8).
   - Install fuel tube assembly (8) on tee adapter (4). Use 7/16 inch open end and 6 inch adjustable wrenches.



3. INSTALL STREET ELBOW WITH ATTACHED FITTINGS ON REGULATOR VALVE.
   - Remove plug and cap from regulator valve (9) and street elbow (7).
   - Apply sealing compound to threads of street elbow (7).
   - Install street elbow (7) with attached fittings (10) on regulator valve (9). Use 6 inch adjustable wrench.



4. INSTALL TWO VALVE ELEMENTS IN REGULATOR VALVE.
   - Install push-on nuts (11) on two elements (12). Use round nose pliers.
   - Install two elements (12) in regulator valve (9).
   - Install push-on nuts (13) on two elements (12). Use round nose pliers.



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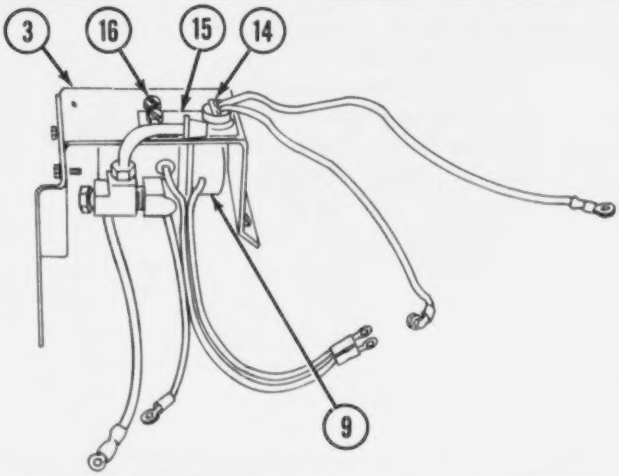
5. INSTALL REGULATOR VALVE ON VALVE BRACKET.
   - Install regulator valve (9), thermostat (14), thermostat bracket (15), and two new screws with captive washers (16) on valve bracket (3). Use 1/4 inch flat tip screwdriver.



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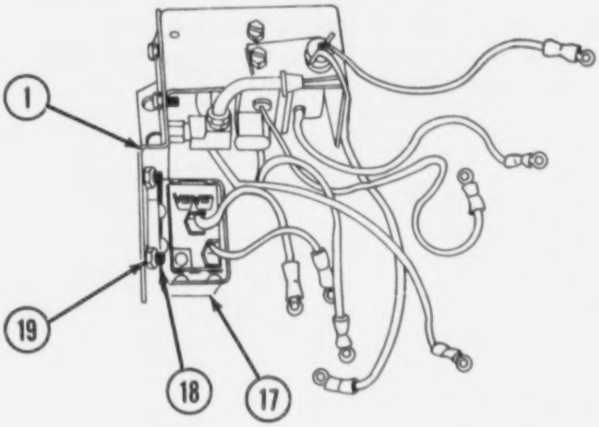
6. INSTALL RELAY ON RELAY BRACKET.
   - Install relay (17), two new screws with captive washers (18), and new nuts with captive washers (19) on relay bracket (1). Use 1/4 inch flat tip screwdriver and 3/8 inch box end wrench.



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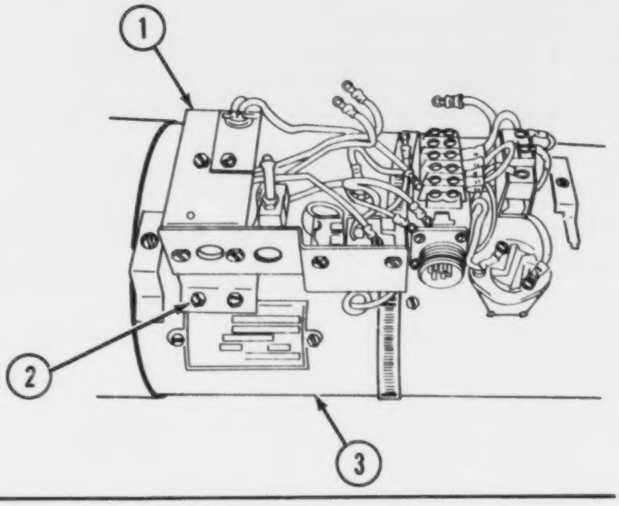
## 14-4 FUEL BURNING HEATER — Continued

### N. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY INSTALLATION

1. INSTALL VALVE BRACKET AND REGULATOR VALVE ASSEMBLY ON FUEL BURNING HEATER.
   - Install valve assembly (1) and four new screws with captive washers (2) on heater (3). Use 1/4 inch flat tip screwdriver.



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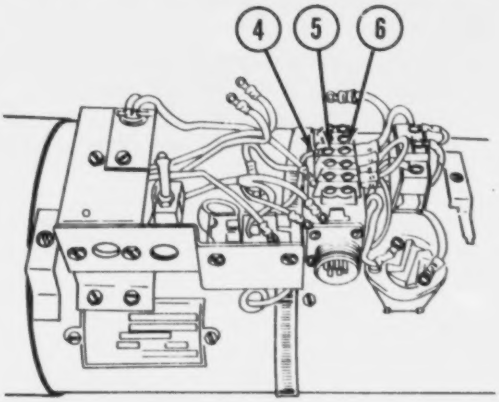
2. INSTALL RELAY VALVE LEAD NO. 4 ON TERMINAL BLOCK.
   - Install Relay Vaive Lead No. 4 (4) and screw (5) on Terminal Block Terminal No. 2 (6). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tag from lead.



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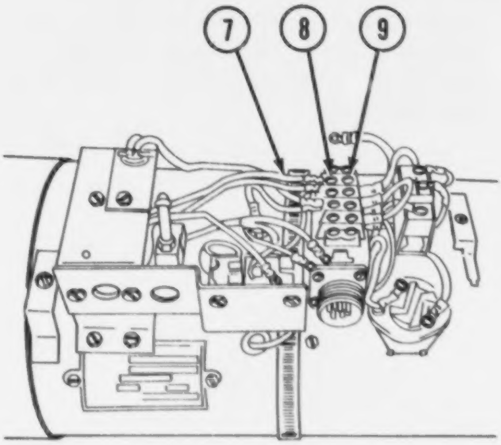
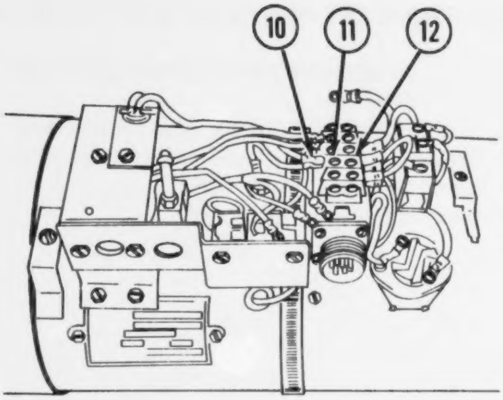
3. INSTALL TWO VALVE HEATER LEADS ON TERMINAL BLOCK.
   - Install two valve heater leads (7) and screws (8) on Terminal Block Terminal No. 1 (9). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tags from leads.



4. INSTALL TWO THERMOSTAT LEADS ON TERMINAL BLOCK.
   - Install thermostat lead (10) and screw (11) on Terminal Block Terminal No. 3 (12). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tag from lead.



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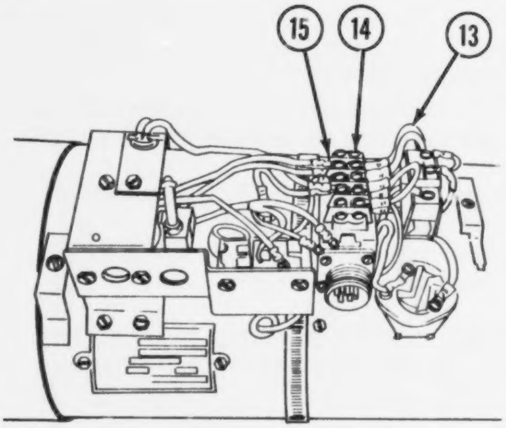
- Install thermostat lead (13) and screw (14) on Terminal Block Terminal No. 1 (15). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
- Remove tag from lead.



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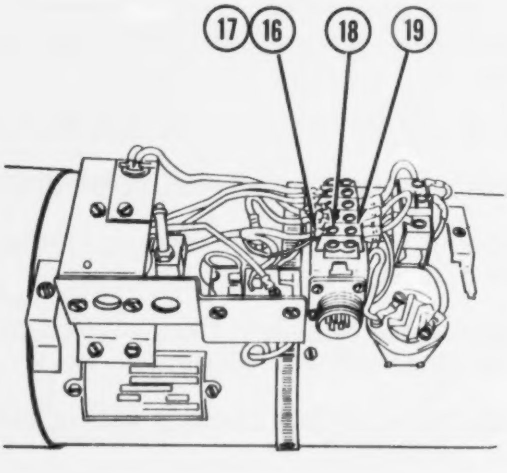
5. INSTALL RELAY LEAD NO. 1 AND SHUTOFF VALVE LEAD ON TERMINAL BLOCK.
   - Install Relay Lead No. 1 (16), regulator shutoff valve lead (17), and screw (18) on Terminal Block Terminal No. 4 (19). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tags from leads.



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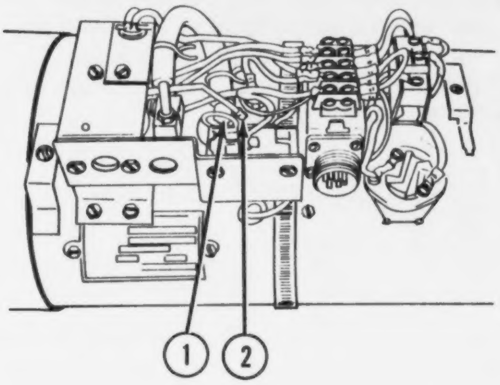
## N. VALVE BRACKET AND REGULATOR VALVE ASSEMBLY INSTALLATION — Continued

6. INSTALL PRESSURE REGULATOR LEAD ON RELAY TERMINAL.
   - Install pressure regulator lead (1) on Relay Terminal No. 2 (2). (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove tag from lead.



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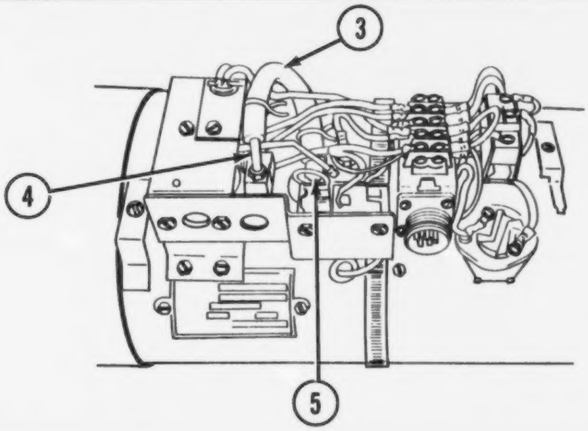
7. INSTALL FUEL LINE HOSE ON FUEL BURNING HEATER.
   - Remove plugs and caps from hose (3), fuel tube assembly (4), and fuel line connector (5).
   - Install hose (3) on fuel tube assembly (4). Use hose clamp pliers.
   - Install hose (3) on fuel line connector (5). Use hose clamp pliers.

8. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)



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## O. FUEL BURNING HEATER DISASSEMBLY

1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)

2. REMOVE LIMIT SWITCH FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-5.)

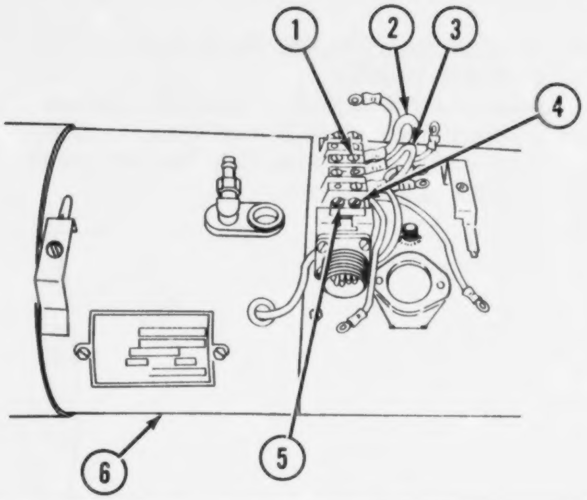
3. REMOVE IGNITER FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-6.)

4. REMOVE FLAME SWITCH ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-7.)

5. REMOVE VALVE BRACKET AND REGULATOR VALVE ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-10.)

6. REMOVE MOUNTING BRACKET AND MOUNTING CLAMP FROM FUEL BURNING HEATER. (SEE TM 9-1095-205-20.)

7. REMOVE TERMINAL BLOCK FROM FUEL BURNING HEATER.
   - Tag and mark leads. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
   - Remove four screws (1), leads (2), and one jumper lead (3) from terminal block (4). Use 1/4 inch flat tip screwdriver.
   - Remove four screws (5) and terminal block (4) from heater (6). Use 1/4 inch flat tip screwdriver.



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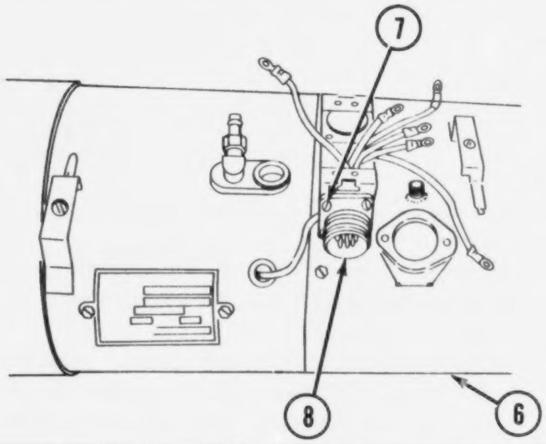
8. REMOVE RECEPTACLE J30 FROM FUEL BURNING HEATER.
   - Remove four screws (7) and Receptacle J30 (8) from heater (6). Use 1/4 inch flat tip screwdriver.



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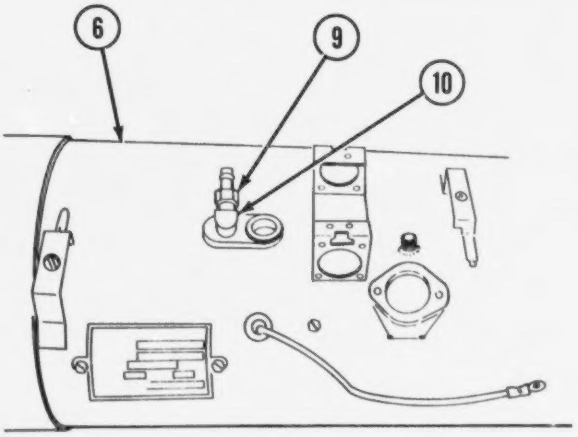
9. REMOVE FUEL LINE FITTINGS FROM FUEL BURNING HEATER.
   - Remove fuel line connector (9) from street elbow (10). Use 7/16 inch open end wrench.
   - Plug connector, and cap street elbow.
   - Remove street elbow (10) from heater (6). Use 6 inch adjustable wrench.
   - Plug heater, and cap street elbow.



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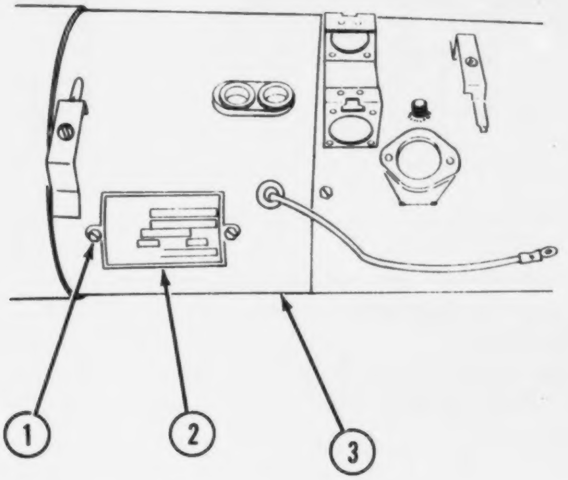
## O. FUEL BURNING HEATER DISASSEMBLY — Continued

10. REMOVE NAME PLATE FROM FUEL BURNING HEATER.
    - Remove two screws with captive washers (1) and name plate (2) from heater (3). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.



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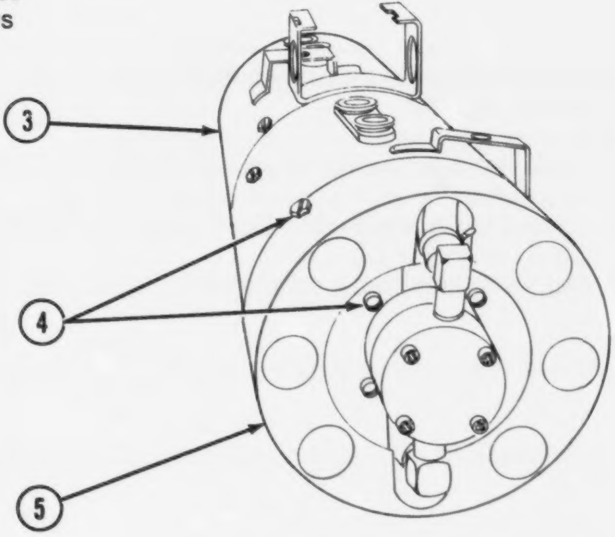
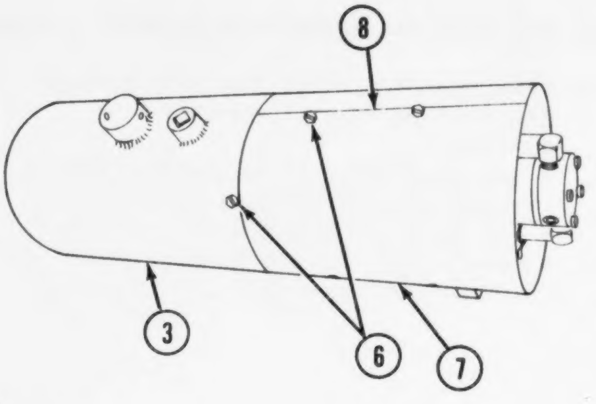
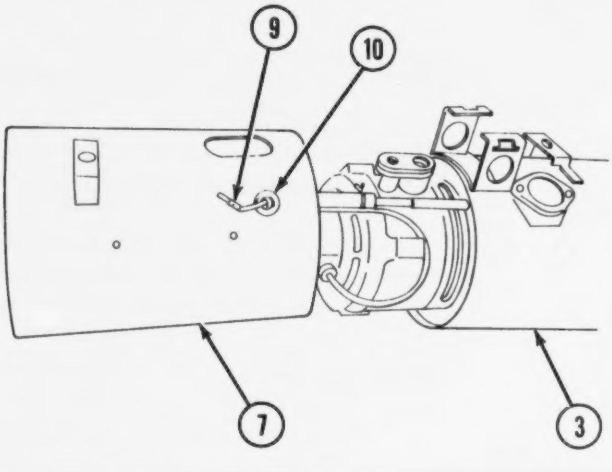
11. REMOVE AIR INLET COVER FROM FUEL BURNING HEATER.
    - Remove eight screws with captive washers (4) and air inlet cover (5) from heater (3). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.



12. REMOVE BURNER CASING FROM FUEL BURNING HEATER.
    - Remove seven screws with captive washers (6) from burner casing (7). Use 1/4 inch flat tip screwdriver. Discard screws with captive washers.
    - Spread burner casing (7) at seam (8), and slide burner casing away from heater (3).
    - Feed lead (9) through grommet (10).





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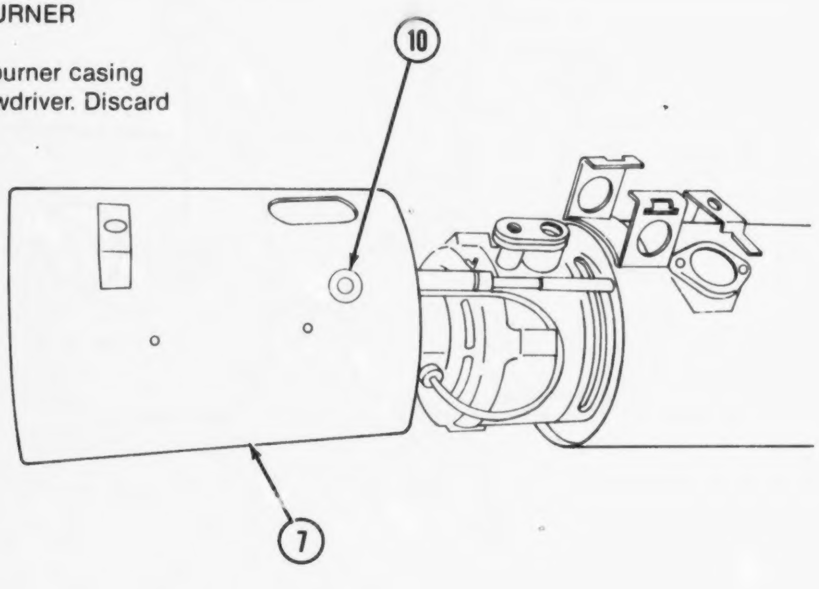
**NOTE**

Do not remove grommet unless required for maintenance.

13. REMOVE GROMMET FROM BURNER CASING.
    - Remove grommet (10) from burner casing (7). Use 1/4 inch flat tip screwdriver. Discard grommet.



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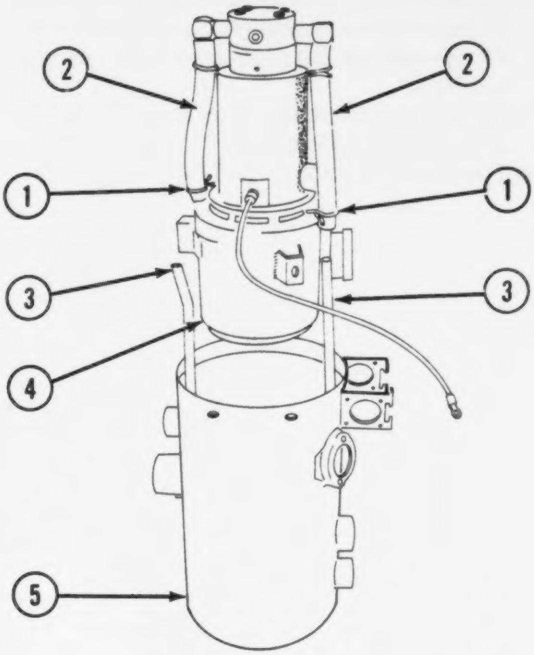
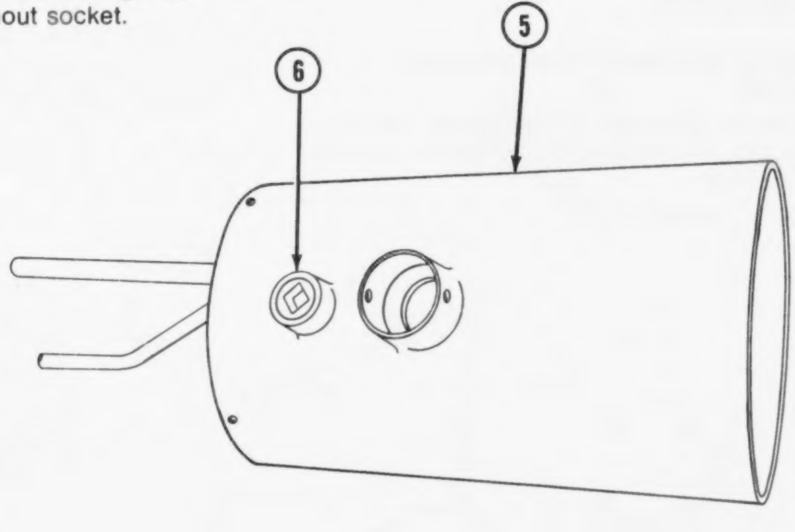
## O. FUEL BURNING HEATER DISASSEMBLY — Continued

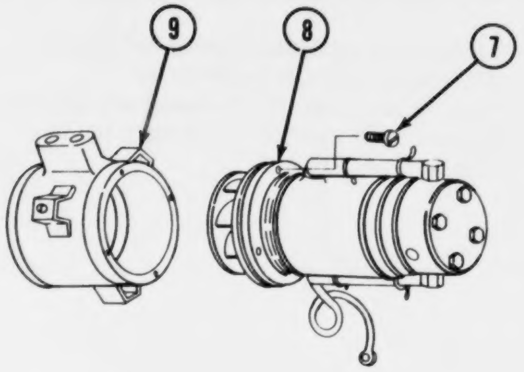
14. REMOVE MOTOR PUMP, FAN, AND BURNER GROUP FROM HEAT EXCHANGER ASSEMBLY.
    - Open hose clamps (1) and disconnect hoses (2) from tubes (3). Use hose clamp pliers.
    - Plug hoses, and cap tubes.
    - Remove pump, fan, and burner group (4) from heat exchanger (5).



15. REMOVE DRAIN PLUG FROM HEAT EXCHANGER ASSEMBLY.
    - Remove plug (6) from heat exchanger (5). Use ratchet handle without socket.



16. REMOVE MOTOR AND PUMP ASSEMBLY FROM BURNER ASSEMBLY.
    - Remove four screws (7) and motor and pump assembly (8) from burner assembly (9). Use 1/4 inch flat tip screwdriver.



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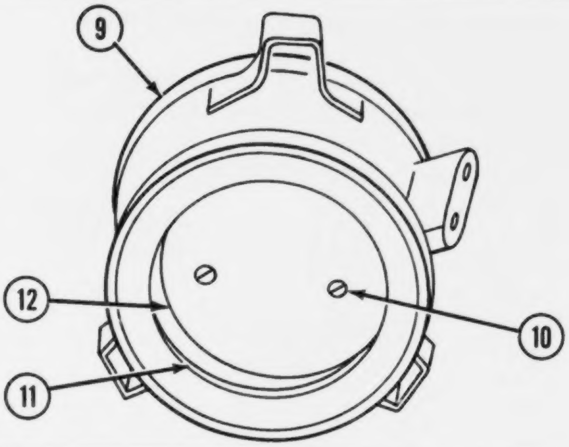
17. REMOVE VAPORIZER FROM BURNER ASSEMBLY.
    - Remove two screws (10), vaporizer retainer (11), and vaporizer (12) from burner assembly (9). Use 1/4 inch flat tip screwdriver.



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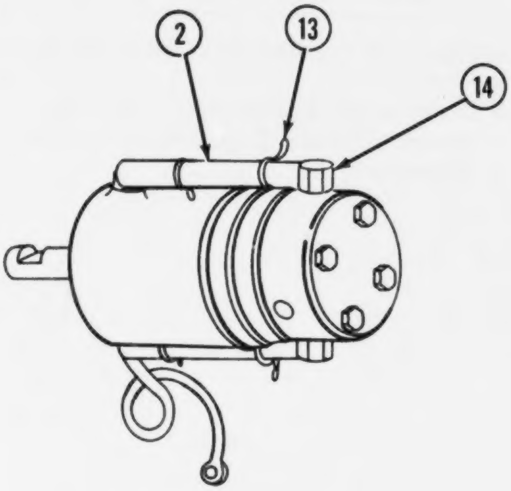
18. REMOVE TWO HOSES FROM ELBOWS.
    - Tag and mark hoses.
    - Remove four hose clamps (13) from two hoses (2). Use hose clamp pliers.
    - Remove two hoses (2) from two elbows (14).
    - Plug hoses, and cap elbows.



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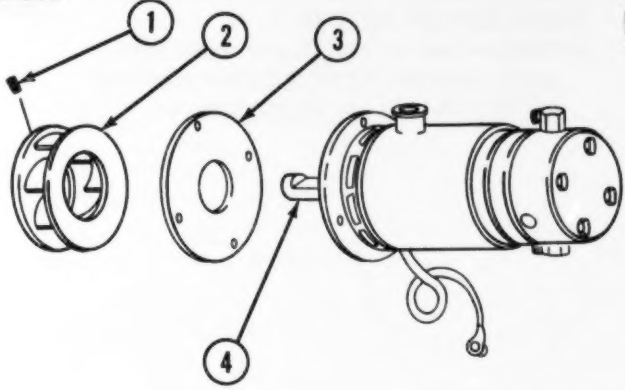
## O. FUEL BURNING HEATER DISASSEMBLY — Continued

19. REMOVE FAN ASSEMBLY AND AIR INLET PLATE FROM MOTOR PUMP SHAFT.
    - Remove set screw (1), fan assembly (2), and air inlet plate (3) from motor shaft (4). Use 3/32 inch hex key.



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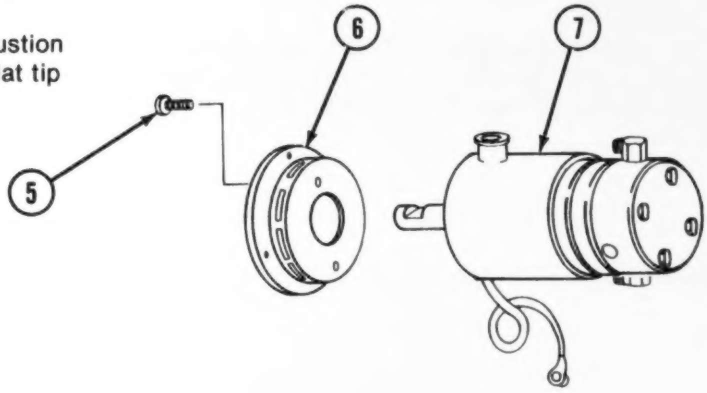
20. REMOVE AIR COMBUSTION INLET FROM PUMP MOTOR.
    - Remove two screws (5) and air combustion inlet (6) from motor (7). Use 1/4 inch flat tip screwdriver.



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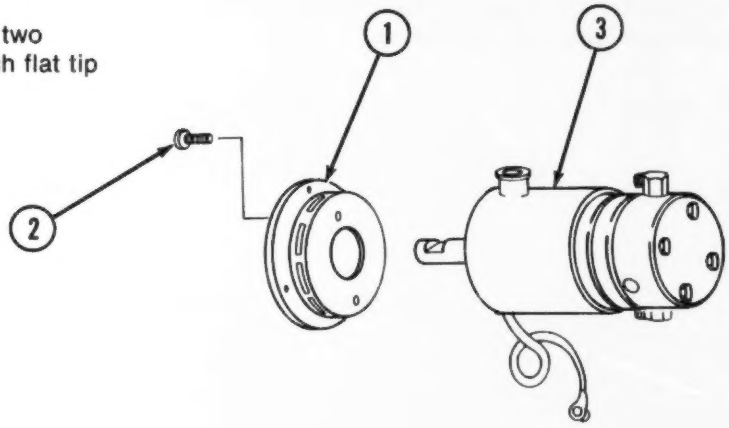
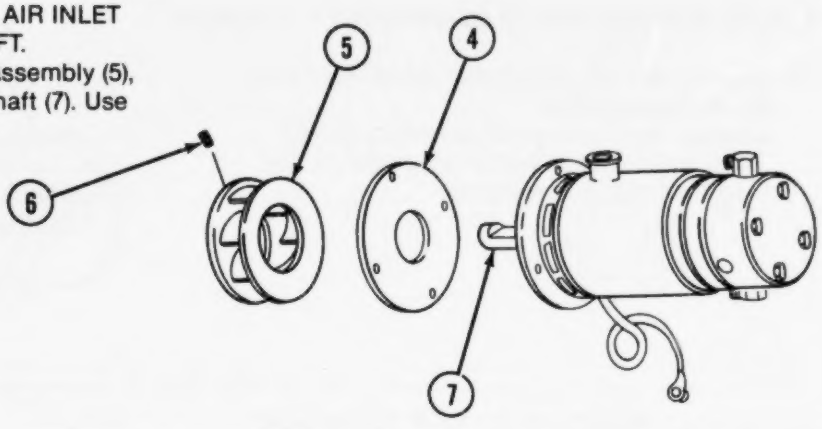
## P. FUEL BURNING HEATER REASSEMBLY

1. INSTALL AIR COMBUSTION INLET ON PUMP MOTOR.
    - Install air combustion inlet (1) and two screws (2) on motor (3). Use 1/4 inch flat tip screwdriver.



2. INSTALL FAN ASSEMBLY AND AIR INLET PLATE ON MOTOR PUMP SHAFT.
   - Install air inlet plate (4), fan assembly (5), and set screw (6) on motor shaft (7). Use 3/32 inch hex key.



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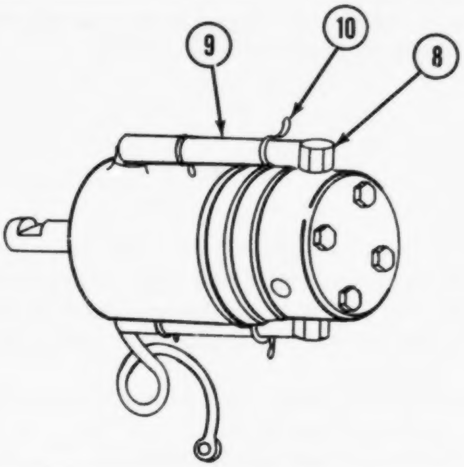
3. INSTALL TWO HOSES ON ELBOWS.
   - Remove plugs and caps from two elbows (8) and two hoses (9).
   - Position four hose clamps (10) on two hoses (9). Use hose clamp pliers.
   - Connect two hoses (9) to two elbows (8). Use hose clamp pliers.
   - Remove tags from hoses.



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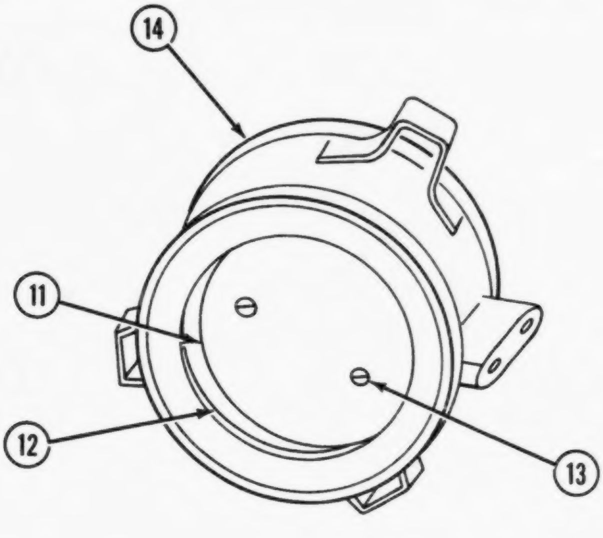
4. INSTALL VAPORIZER ON BURNER ASSEMBLY.
   - Install vaporizer (11), vaporizer retainer (12), and two screws (13) on burner assembly (14). Use 1/4 inch flat tip screwdriver.



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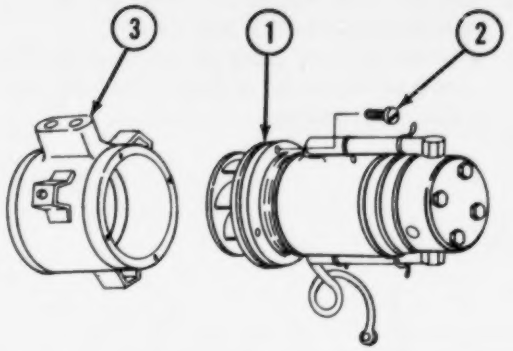
## P. FUEL BURNING HEATER REASSEMBLY — Continued

5. INSTALL MOTOR AND PUMP ASSEMBLY ON BURNER ASSEMBLY.
   - Install motor and pump assembly (1) and four screws (2) on burner assembly (3). Use 1/4 inch flat tip screwdriver.



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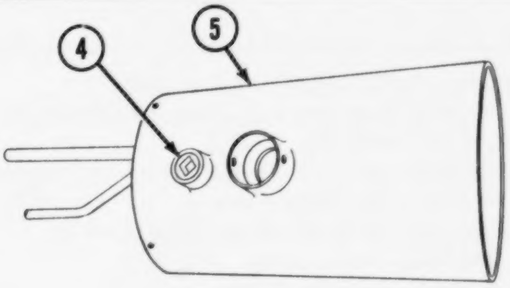
6. INSTALL DRAIN PLUG ON HEAT EXCHANGER ASSEMBLY.
   - Install plug (4) in heat exchanger (5). Use ratchet handle without socket.



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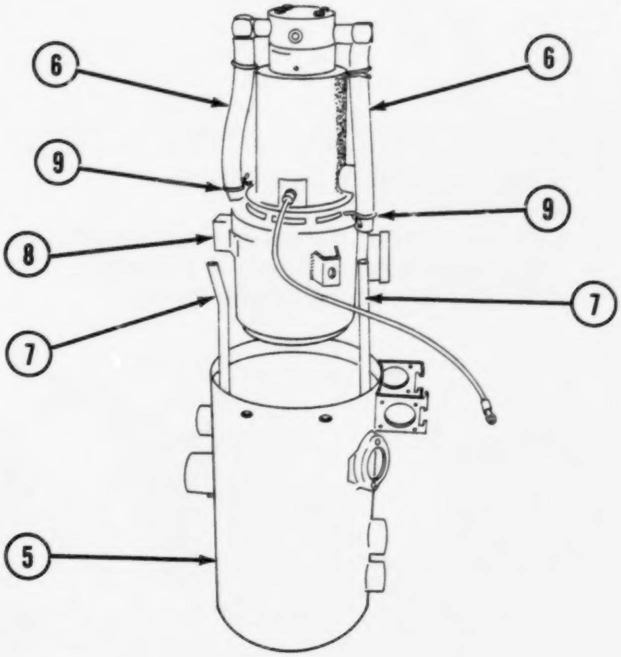
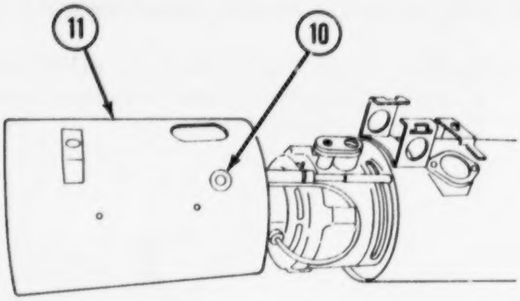
7. INSTALL MOTOR PUMP, FAN, AND BURNER GROUP ON HEAT EXCHANGER ASSEMBLY.
   - Remove plugs and caps from hoses (6) and tubes (7).
   - Position pump, fan, and burner group (8) on heat exchanger (5).
   - Connect hoses (6) to tubes (7).
   - Position hose clamps (9) to secure hoses (6) on tubes (7). Use hose clamp pliers.



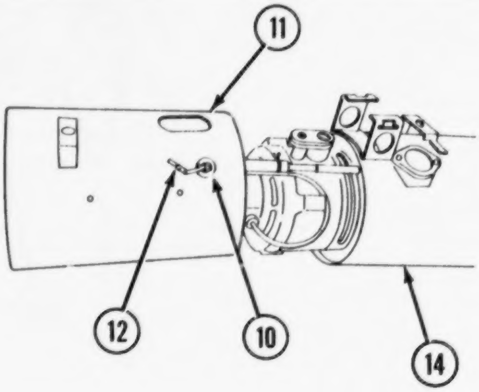
**NOTE**

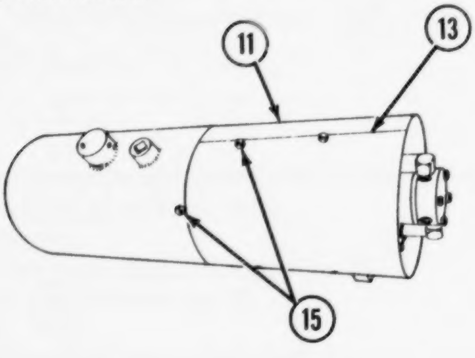
If grommet was not removed, go to step 9.

8. INSTALL NEW GROMMET IN BURNER CASING.
   - Install new grommet (10) in burner casing (11). Use 1/4 inch flat tip screwdriver.

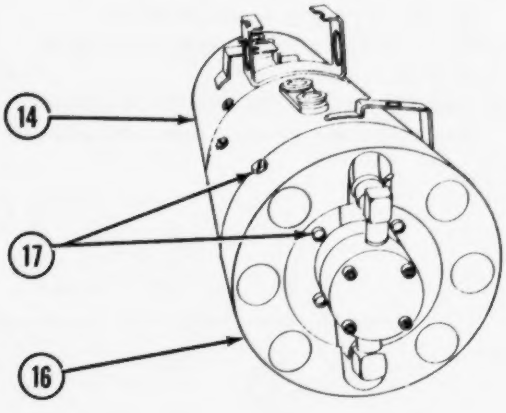


9. INSTALL BURNER CASING ON FUEL BURNING HEATER.
   - Feed lead (12) through grommet (10).
   - Spread burner casing (11) at seam (13), and slide burner casing on heater (14).
   - Install seven new screws with captive washers (15) on burner casing (11). Use 1/4 inch flat tip screwdriver.





10. INSTALL AIR INLET COVER ON FUEL BURNING HEATER.
    - Install air inlet cover (16) and eight new screws with captive washers (17) on heater (14). Use 1/4 inch flat tip screwdriver.



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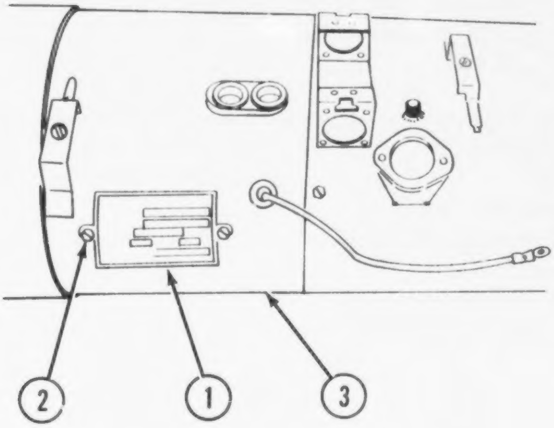
**P. FUEL BURNING HEATER REASSEMBLY — Continued**

11. INSTALL NAME PLATE ON FUEL BURNING HEATER.
    - Install name plate (1) and two new screws with captive washers (2) on heater (3). Use 1/4 inch flat tip screwdriver.



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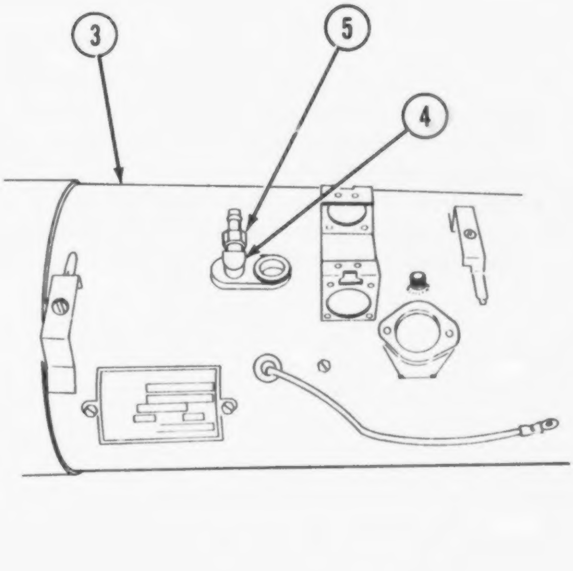
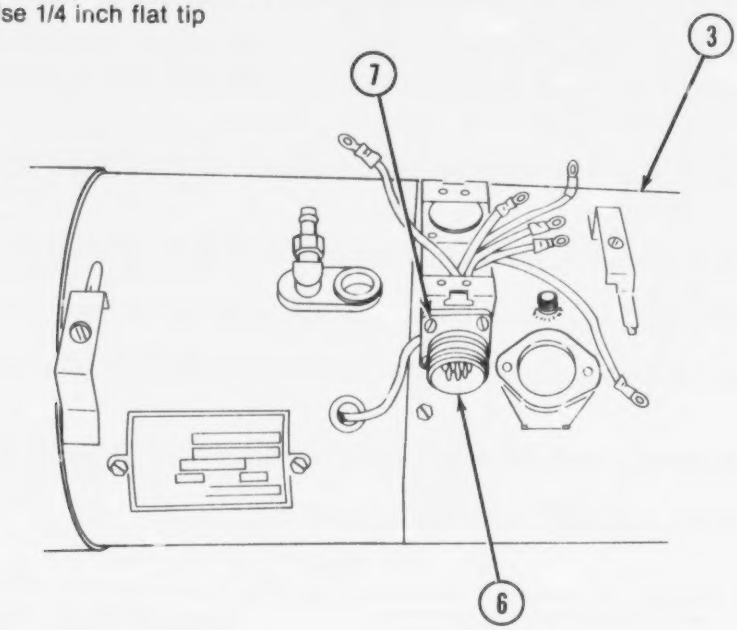
12. INSTALL FUEL LINE FITTINGS ON FUEL BURNING HEATER.
    - Remove plug and cap from heater (3) and street elbow (4).
    - Apply sealing compound to threads of street elbow (4).
    - Install street elbow (4) on heater (3). Use 6 inch adjustable wrench.
    - Remove plug and cap from fuel line connector (5) and street elbow (4).
    - Apply sealing compound to threads of street elbow (4).
    - Install fuel line connector (5) on street elbow (4). Use 7/16 inch open end wrench.



13. INSTALL RECEPTACLE J30 ON FUEL BURNING HEATER.
    - Install Receptacle J30 (6) and four screws (7) on heater (3). Use 1/4 inch flat tip screwdriver.



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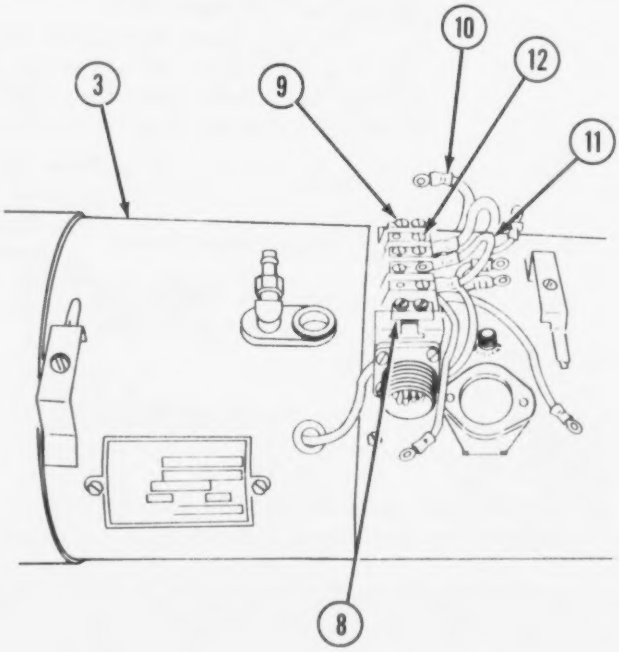
14. INSTALL TERMINAL BLOCK ON FUEL BURNING HEATER.
    - Install terminal block (8) and four screws (9) on heater (3). Use 1/4 inch flat tip screwdriver.
    - Install four leads (10), one jumper lead (11), and four screws (12) on terminal block (8). Use 1/4 inch flat tip screwdriver. (See Fuel Burning Heater Wiring Diagram, Page 14-5.)
    - Remove tags from leads.



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## P. FUEL BURNING HEATER REASSEMBLY — Continued

15. INSTALL MOUNTING CLAMP AND MOUNTING BRACKET ON FUEL BURNING HEATER. (SEE TM 9-1095-205-20.)
16. INSTALL VALVE BRACKET AND REGULATOR VALVE ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-18.)
17. INSTALL FLAME SWITCH ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-10.)
18. INSTALL IGNITER ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-7.)
19. INSTALL LIMIT SWITCH ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-6.)
20. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)
21. ADJUST FLAME SWITCH ASSEMBLY. (SEE FUEL BURNING HEATER, PAGE 14-32.)
22. TEST THERMOSTAT. (SEE FUEL BURNING HEATER, PAGE 14-33.)

---

## Q. FLAME SWITCH ASSEMBLY ADJUSTMENT

**NOTE**

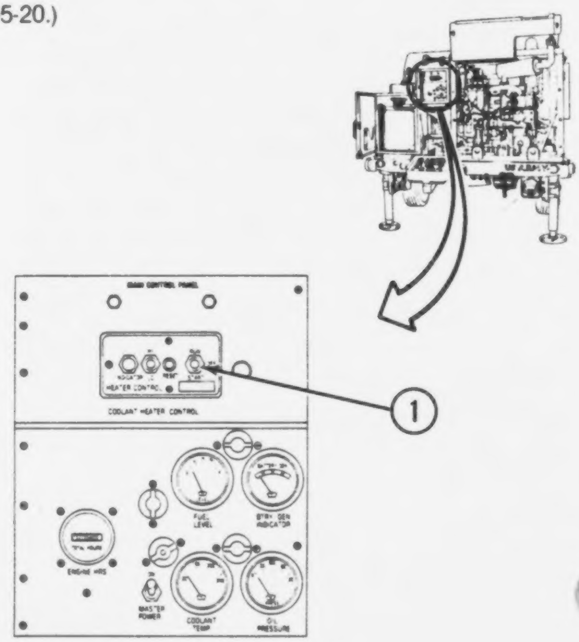
***PRELIMINARY PROCEDURES:***

Install Engine Coolant Heater. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)

**NOTE**

Adjust flame switch when heater is cold.

1. REMOVE COVER ASSEMBLY FROM FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)
2. OPEN MAIN CONTROL PANEL (MCP) DOOR. (SEE TM 9-1095-205-10.)
3. LIFT AND SET MASTER POWER SWITCH ON MCP TO ON. (SEE TM 9-1095-205-10.)
4. MAKE SURE COOLANT HEATER RUN/OFF/START SWITCH (1) IS OFF.

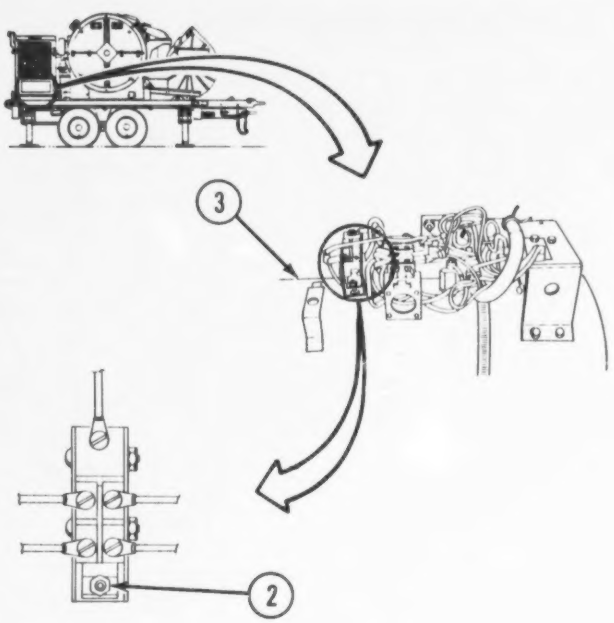

MAIN CONTROL PANEL
INDICATOR
RESET
START
HEATER CONTROL
COOLANT HEATER CONTROL
1
FUEL LEVEL
STBY GEN INDICATOR
ENGINE HRS
MASTER POWER
COOLANT TEMP
OIL PRESSURE

5. ADJUST FLAME SWITCH.
   - Turn adjusting nut (2) to left until coolant heater (3) starts. Use 5/16 inch socket with speeder handle.
   - Turn adjusting nut (2) slowly to right until coolant heater (3) goes off. Use 5/16 inch socket with speeder handle.
   - Turn adjusting nut (2) to right exactly 1/2 turn. Use 5/16 inch socket with 1/4 inch drive speeder handle.

6. LIFT AND SET MASTER POWER SWITCH ON MCP TO DOWN (OFF) POSITION. (SEE TM 9-1095-205-10.)

7. CLOSE MAIN CONTROL PANEL DOOR. (SEE TM 9-1095-205-10.)

8. INSTALL COVER ASSEMBLY ON FUEL BURNING HEATER. (SEE FUEL BURNING HEATER, PAGE 14-4.)



### NOTE

***FOLLOW-ON MAINTENANCE:***
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

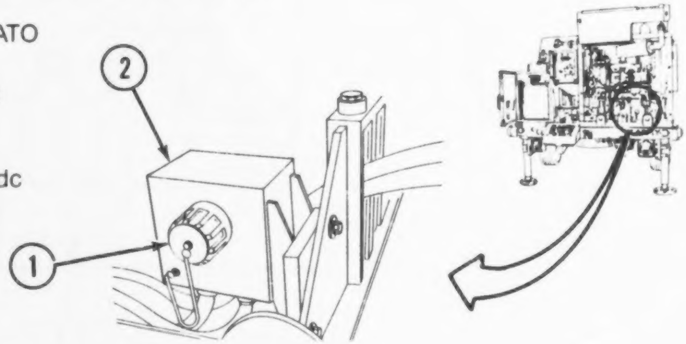
---

## R. THERMOSTAT TEST

### NOTE

***PRELIMINARY PROCEDURES:***
Install Engine Coolant Heater. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Close Coolant Heater Shutoff Valves. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)

1. CONNECT 24 V DC POWER SUPPLY TO NATO RECEPTACLE.
   - Turn cap (1) to left, and remove cap from NATO receptacle (2).
   - Connect 24 V dc power supply to NATO receptacle (2). Use slave cable and 24 V dc power supply.



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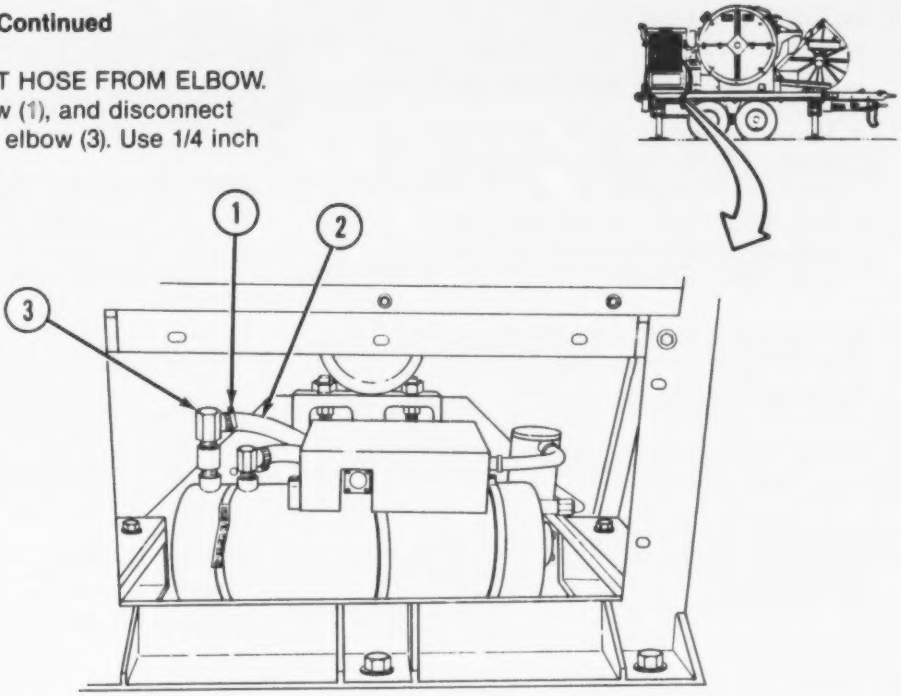
## R. THERMOSTAT TEST—Continued

2. DISCONNECT OUTLET HOSE FROM ELBOW.
   - Loosen clamp screw (1), and disconnect outlet hose (2) from elbow (3). Use 1/4 inch flat tip screwdriver.
   - Plug outlet hose.



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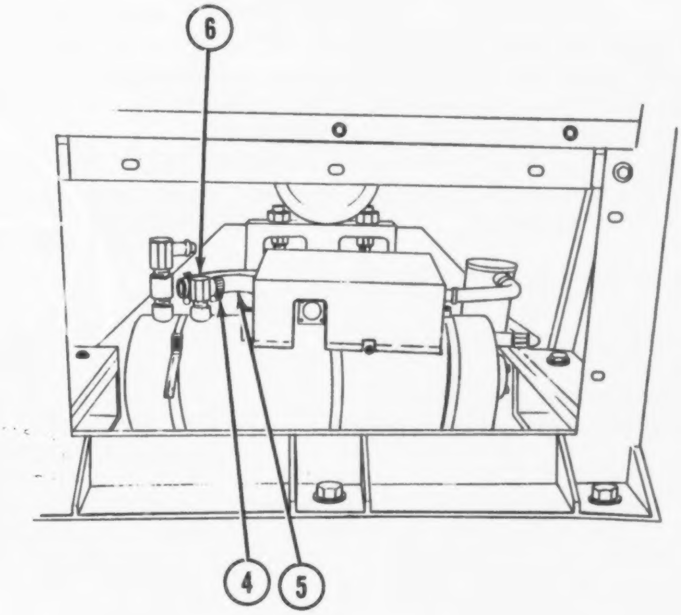
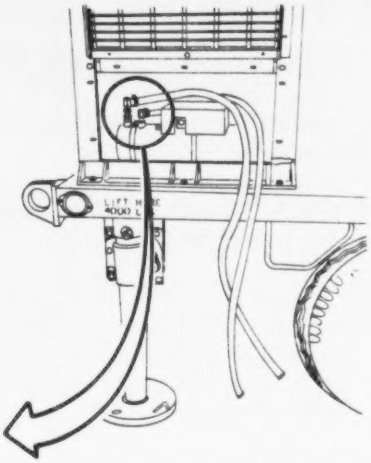
3. DISCONNECT INLET HOSE FROM ELBOW.
   - Loosen clamp screw (4), and disconnect inlet hose (5) from elbow (6). Use 1/4 inch flat tip screwdriver.
   - Plug inlet hose.

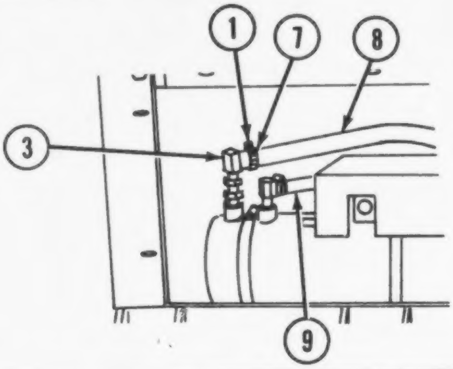




**NOTE**

Test hoses must be at least 6 ft (1.8 m) long.

4. CONNECT OUTLET TEST HOSE AND INLET TEST HOSE TO ELBOWS.
   - Place clamp (7) on outlet test hose (8).
   - Connect outlet test hose (8) to elbow (3), and tighten clamp screw (1). Use 1/4 inch flat tip screwdriver.
   - Repeat above installation steps for inlet test hose (9).



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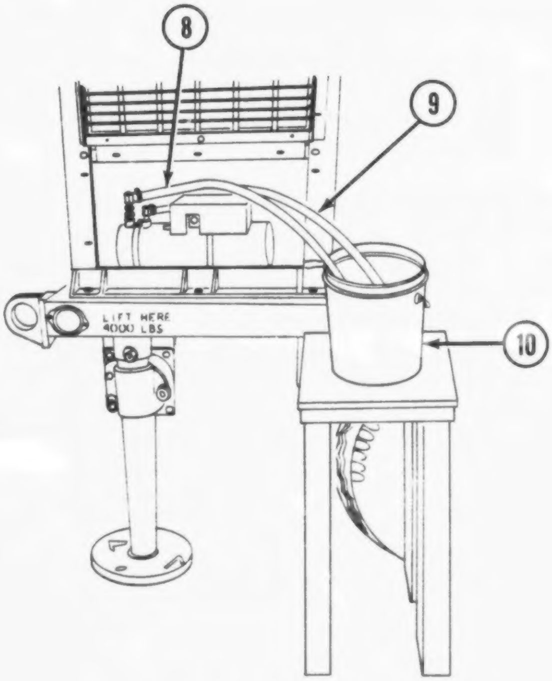
**NOTE**

Suitable container must hold 5 gal (18.9 L).

5. PRIME ENGINE COOLANT HEATER.
   - Fill suitable container (10) with 5 gal (18.9 L) of clean antifreeze coolant.
   - Fill inlet test hose (9) with coolant.
   - Place inlet test hose (9) and outlet test hose (8) in container (10).



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### R. THERMOSTAT TEST—Continued

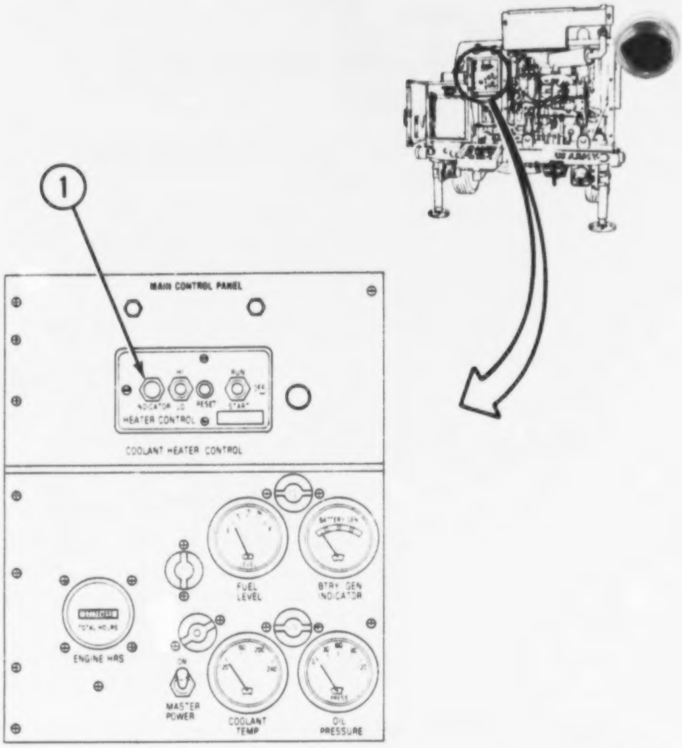
**NOTE**

Indicator lamp will come on within 3 minutes.

6. START ENGINE COOLANT HEATER. (SEE TM 9-1095-205-20.)

7. OPERATE ENGINE COOLANT HEATER UNTIL INDICATOR LAMP (1) GOES OUT. IF INDICATOR LAMP DOES NOT GO OUT WITHIN 55 MINUTES, FUEL BURNING HEATER IS FAULTY.

8. STOP ENGINE COOLANT HEATER. (SEE TM 9-1095-205-20.)

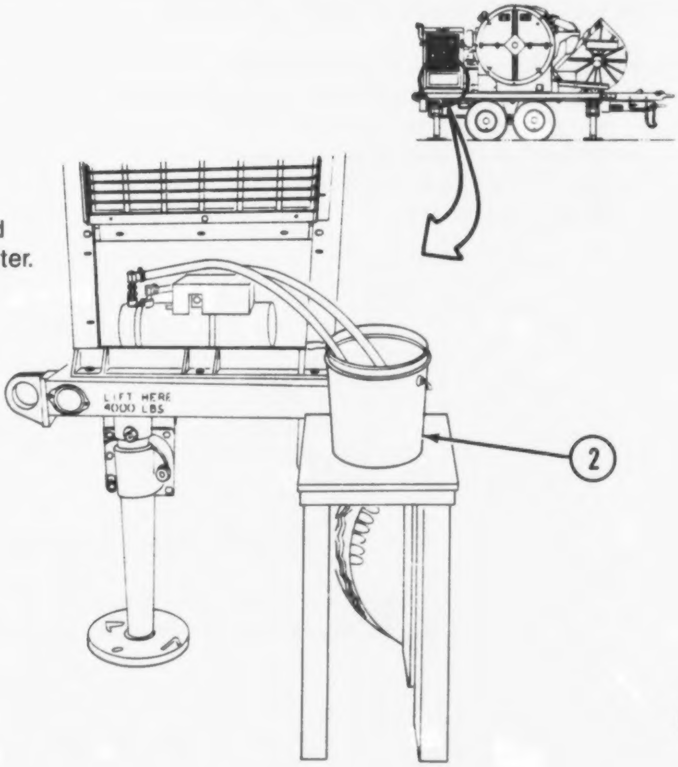

①
MAIN CONTROL PANEL
INDICATOR
LO
HI
RESET
RUN
START
HEATER CONTROL
COOLANT HEATER CONTROL
FUEL LEVEL
BTRY GEN INDICATOR
TOTAL HOURS
ENGINE HRS
ON
MASTER POWER
COOLANT TEMP
OIL PRESSURE

---

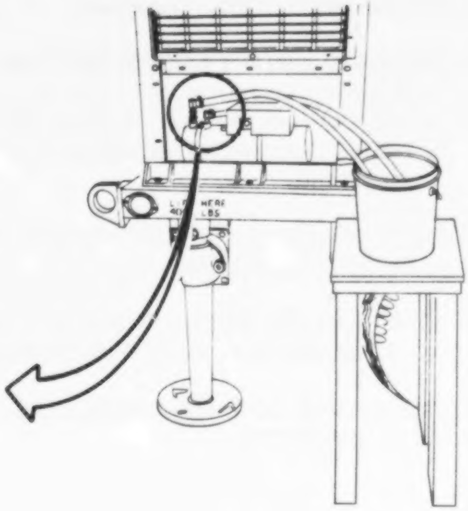
**WARNING**

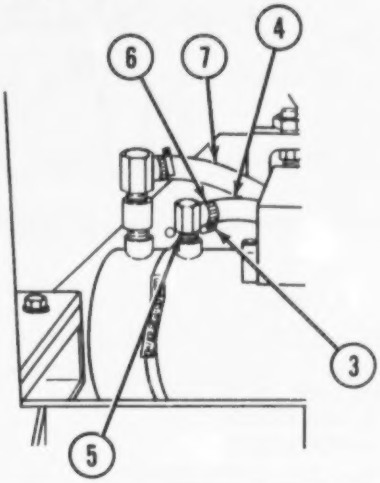
Hot coolant can burn you. Do not get hot coolant on your skin.

9. CHECK TEMPERATURE OF COOLANT.
   - Check temperature of hot coolant in suitable container (2). Temperature should be at least 200°F (93.9°C). Use thermometer.
   - Allow coolant to cool.
   - Dispose of coolant according to local procedures.


LIFT HERE
4000 LBS
②

10. DISCONNECT INLET TEST HOSE AND OUTLET TEST HOSE FROM ELBOWS.
    - Loosen clamp screw (3), and disconnect inlet test hose (4) from elbow (5). Use 1/4 inch flat tip screwdriver.
    - Remove clamp (6) from inlet test hose (4).
    - Repeat above removal steps for outlet test hose (7).





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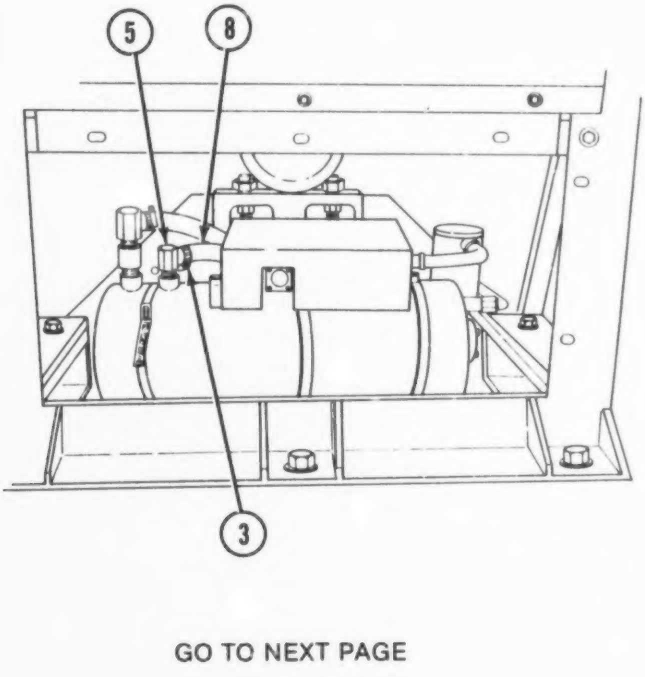
11. CONNECT INLET HOSE TO ELBOW.
    - Remove plug from inlet hose (8).
    - Connect inlet hose (8) to elbow (5), and tighten clamp screw (3). Use 1/4 inch flat tip screwdriver.



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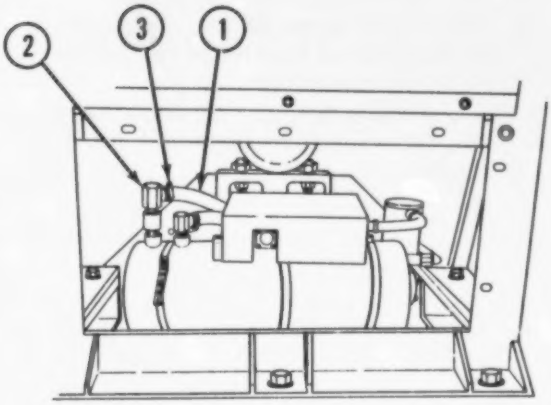
**R. THERMOSTAT TEST—Continued**

12. CONNECT OUTLET HOSE TO ELBOW.
    - Remove plug from outlet hose (1).
    - Connect outlet hose (1) to elbow (2), and tighten clamp screw (3). Use 1/4 inch flat tip screwdriver.

13. OPEN COOLANT HEATER SHUTOFF VALVES. (SEE TM 9-1095-205-10.)

14. START ENGINE COOLANT HEATER. (SEE TM 9-1095-205-20.) CHECK FOR LEAKS.

15. TOP ENGINE COOLANT HEATER. (SEE TM 9-1095-205-20.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

# CHAPTER 15

# DIESEL POWERED HYDRAULIC PUMPING UNIT (DIRECT SUPPORT)

## Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

### 15-1 COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

### 15-2 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are authorized for the M128 Ground Vehicle Mine Dispenser.

### 15-3 REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list TM 9-1095-205-34P, covering direct support and general support maintenance for this equipment.

## Section II. MAINTENANCE PROCEDURES

## 15-4 COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM

### DESCRIPTION

This task covers:
A. ETHER FUEL CYLINDER AND CLAMP BRACKET REMOVAL (p 15-3)
B. ETHER FUEL CYLINDER AND CLAMP BRACKET INSTALLATION (p 15-5)
C. AIR FILTER SERVICE AIR INDICATOR SYSTEM REMOVAL (p 15-6)
D. AIR FILTER SERVICE AIR INDICATOR SYSTEM INSTALLATION (p 15-7)
E. COLD START ASSEMBLY REMOVAL (p 15-9)
F. COLD START ASSEMBLY INSTALLATION (p 15-12)

---

### INITIAL SETUP

***Tools and Special Tools:***

- General mechanic's tool kit 5180-00-177-7033:
  - 3/8 inch box end wrench
  - 7/16 inch open end wrench
  - 7/16 inch box end wrench
  - 1/2 inch open end wrench
  - 1/2 inch box end wrench
  - 9/16 inch open end wrench
  - 7/16 inch socket
  - Ratchet handle
  - 3/8 inch open end wrench
  - Diagonal cutting pliers
  - Round nose pliers
  - No. 2 cross tip screwdriver
  - 5/16 inch flat tip screwdriver
- Cap and plug set 5340-00-450-5718

***Materials/Parts:***

- Ether fuel cylinder 2910-00-505-7420
- Lock washer (2) 5310-00-582-5965
- Self-locking nut (4) 5310-00-088-1251
- Cable ties (3) 5975-00-727-5153
- Self-locking nut 5310-00-877-5797

***References:***

- TM 9-1095-205-10
- TM 9-1095-205-20

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### A. ETHER FUEL CYLINDER AND CLAMP BRACKET REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

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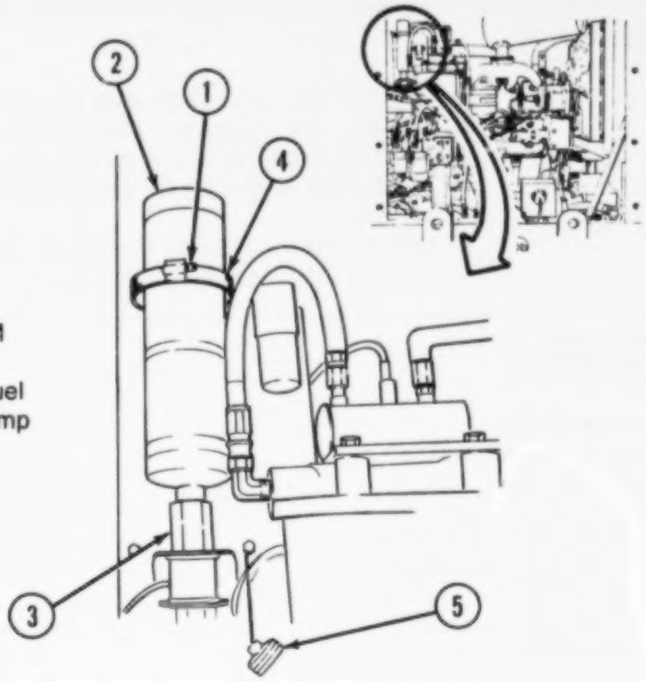
## A. ETHER FUEL CYLINDER AND CLAMP BRACKET REMOVAL — Continued



**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

1. REMOVE ETHER FUEL CYLINDER FROM VALVE BODY AND CLAMP.
   - Loosen clamp screw (1), and remove fuel cylinder (2) from valve body (3) and clamp (4). Use 5/16 inch flat tip screwdriver.
   - Install plug (5) in valve body (3).

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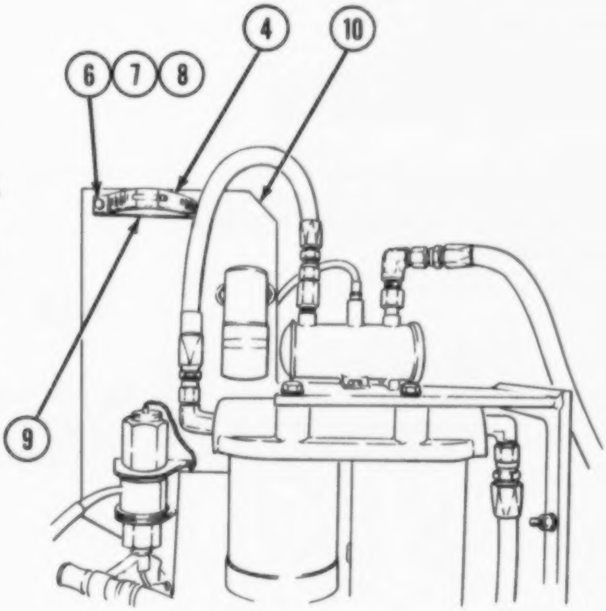
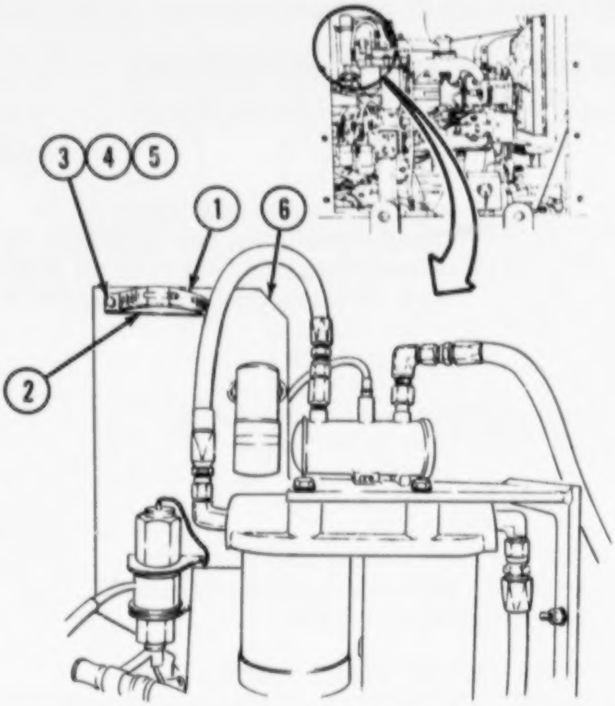


**NOTE**

Do not remove clamp and clamp bracket unless required for maintenance.

2. REMOVE CLAMP AND CLAMP BRACKET FROM FUEL FILTER BRACKET.
   - Remove two self-locking nuts (6), washers (7), screws (8), and clamp bracket (9) with clamp (4) from fuel filter bracket (10). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard self-locking nuts.
   - Remove clamp (4) from clamp bracket (9).

## B. ETHER FUEL CYLINDER AND CLAMP BRACKET INSTALLATION



**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

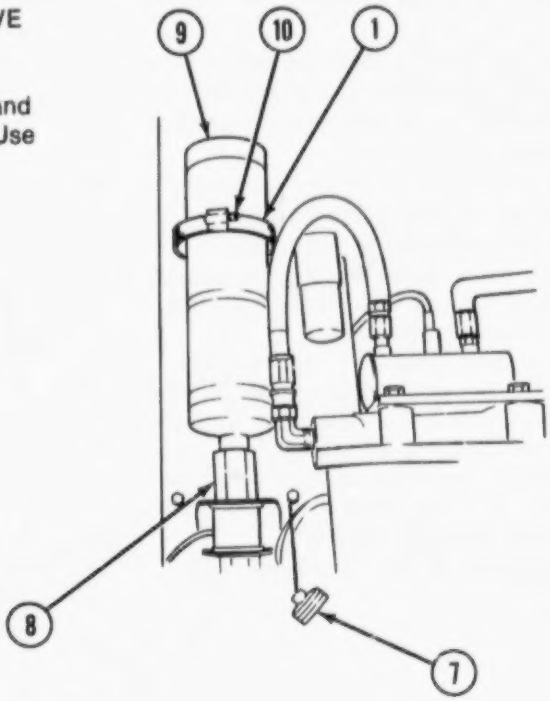
**NOTE**

If clamp and clamp bracket were not removed, go to step 2.

1. INSTALL CLAMP AND CLAMP BRACKET ON FUEL FILTER BRACKET.
   - Place clamp (1) on clamp bracket (2).
   - Install clamp bracket (2) with clamp (1), two screws (3), washers (4), and new self-locking nuts (5) on fuel filter bracket (6). Use 7/16 inch socket with ratchet handle.

---

2. INSTALL ETHER FUEL CYLINDER ON VALVE BODY AND CLAMP.
   - Remove plug (7) from valve body (8).
   - Install fuel cylinder (9) on valve body (8) and clamp (1), and tighten clamp screw (10). Use 5/16 inch flat tip screwdriver.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. See TM 9-1095-205-10.)

GO TO NEXT PAGE

## 15-4 COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM — Continued

### C. AIR FILTER SERVICE AIR INDICATOR SYSTEM REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

**WARNING**

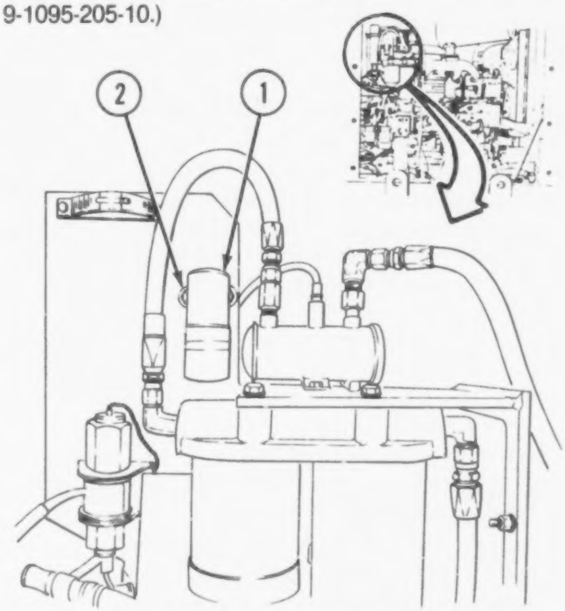
Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

1. REMOVE ETHER FUEL CYLINDER FROM VALVE BODY AND CLAMP. (SEE COLD START ASSEMBLY AND AIR FILTER SERVICE AIR INDICATOR SYSTEM, PAGE 15-4.)

2. REMOVE AIR FILTER SERVICE AIR INDICATOR FROM SPECIAL FLANGE.
   - Turn indicator (1) to left, and remove from flange (2).



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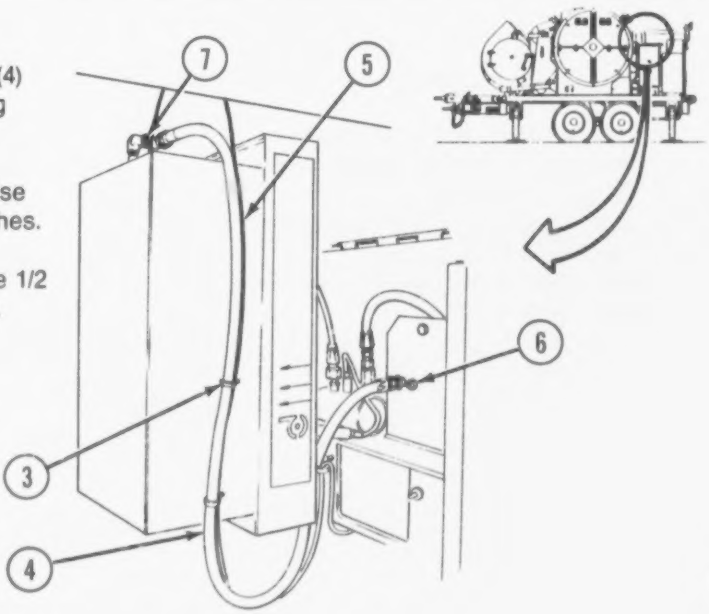
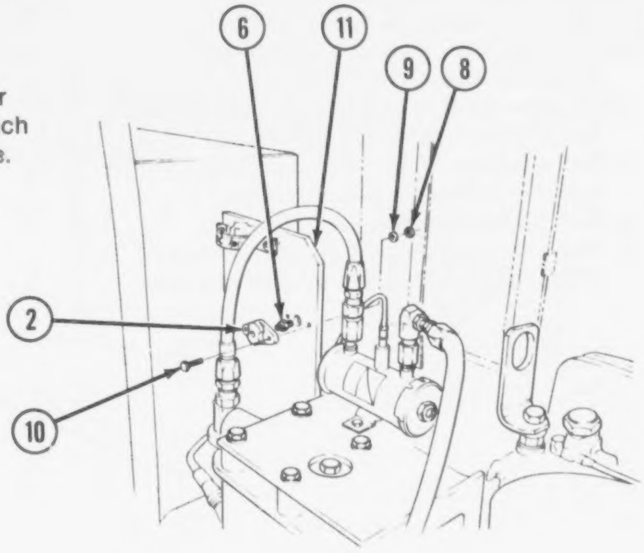
3. REMOVE AIR FILTER SERVICE AIR INDICATOR HOSE FROM DISPENSER.
   - Remove three cable ties (3) from hose (4) and ether tube (5). Use diagonal cutting pliers. Discard cable ties.
   - Tag and mark hose.
   - Disconnect hose (4) from adapter (6). Use 1/2 inch and 9/16 inch open end wrenches.
   - Plug hose, and cap adapter.
   - Disconnect hose (4) from elbow (7). Use 1/2 inch and 9/16 inch open end wrenches.
   - Plug hose, and cap adapter.
   - Remove hose (4) from dispenser.



4. REMOVE SPECIAL FLANGE AND ADAPTER FROM FUEL FILTER BRACKET.
   - Remove adapter (6) from flange (2). Use 1/2 inch box end wrench.
   - Cap adapter.
   - Remove two nuts (8), lock washers (9), screws (10), and flange (2) from fuel filter bracket (11). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard lock washers.



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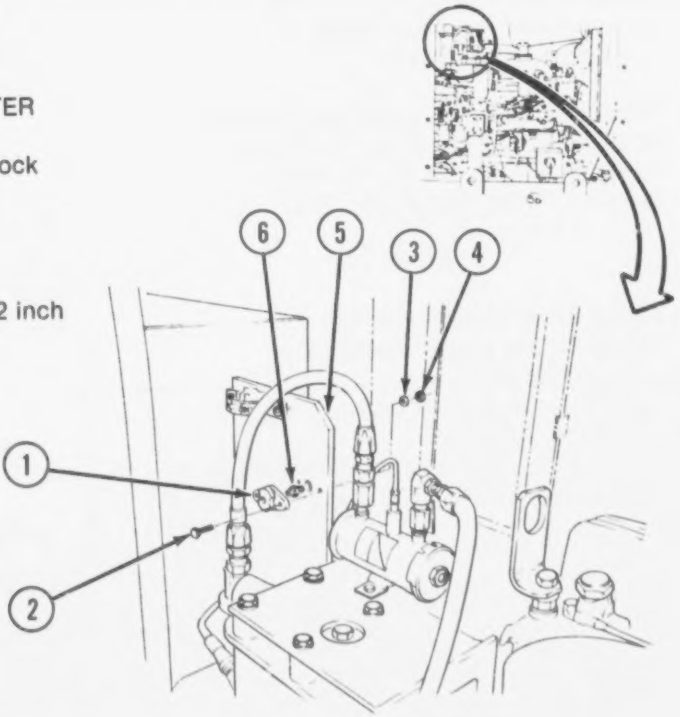
## D. AIR FILTER SERVICE AIR INDICATOR SYSTEM INSTALLATION

1. INSTALL SPECIAL FLANGE AND ADAPTER ON FUEL FILTER BRACKET.
   - Install flange (1), two screws (2), new lock washers (3), and nuts (4) on fuel filter bracket (5). Use 7/16 inch socket with ratchet handle.
   - Remove cap from adapter (6).
   - Install adapter (6) on flange (1). Use 1/2 inch box end wrench.



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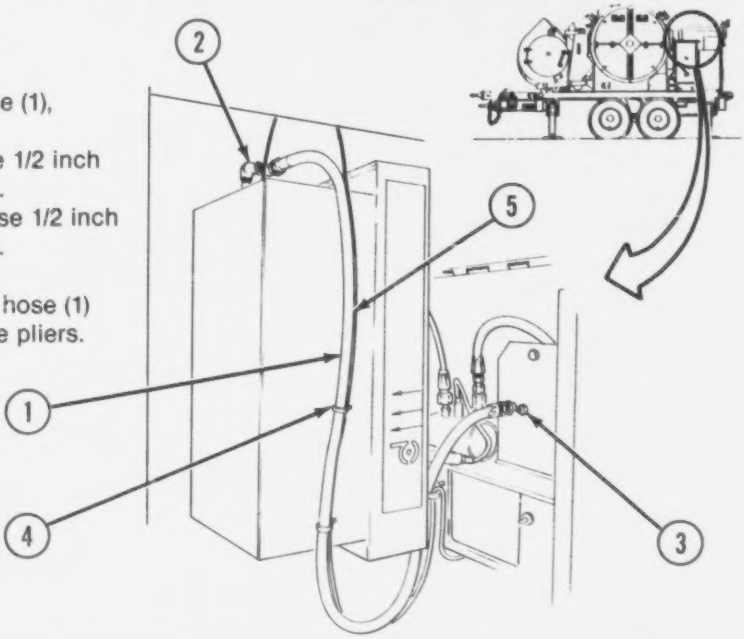
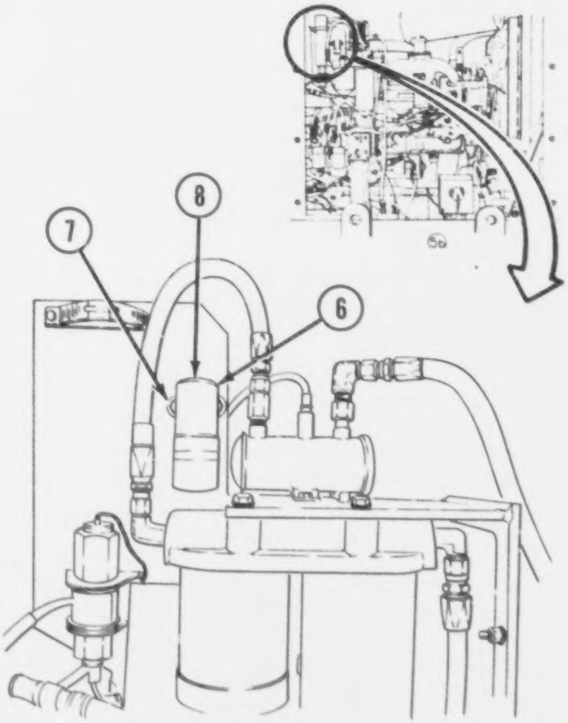
## D. AIR FILTER SERVICE AIR INDICATOR SYSTEM INSTALLATION — Continued

2. INSTALL AIR FILTER SERVICE AIR INDICATOR HOSE ON DISPENSER.
   - Remove plugs and caps from hose (1), elbow (2), and adapter (3).
   - Connect hose (1) to elbow (2). Use 1/2 inch and 9/16 inch open end wrenches.
   - Connect hose (1) to adapter (3). Use 1/2 inch and 9/16 inch open end wrenches.
   - Remove tag from hose.
   - Install three new cable ties (4) on hose (1) and ether tube (5). Use round nose pliers.



3. INSTALL AIR FILTER SERVICE AIR INDICATOR ON SPECIAL FLANGE.
   - Install indicator (6) on flange (7).
   - Press reset button (8).

4. INSTALL ETHER FUEL CYLINDER ON VALVE BODY AND CLAMP. (SEE COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM, PAGE 15-5.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Close Engine Hinged Panel. (See TM 9-1095-205-10.)

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)

Close Right Battery Box Cover. (See TM 9-1095-205-10.)

## E. COLD START ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

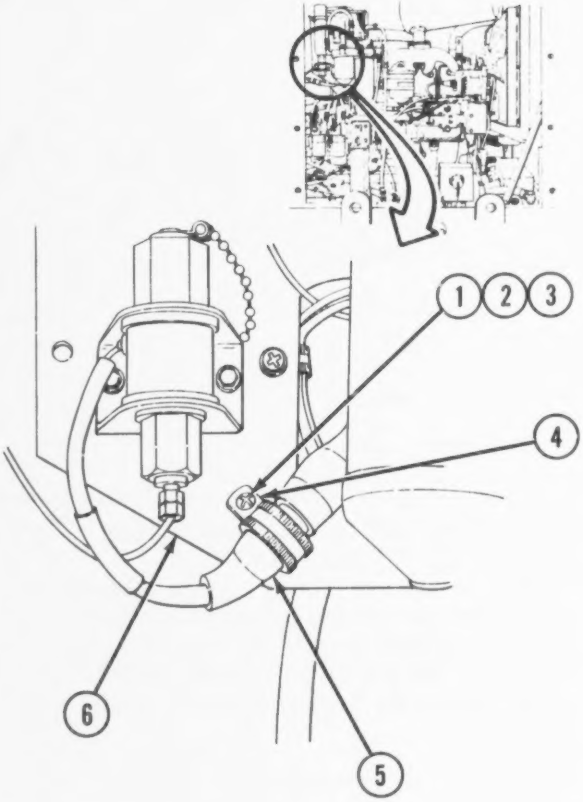
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

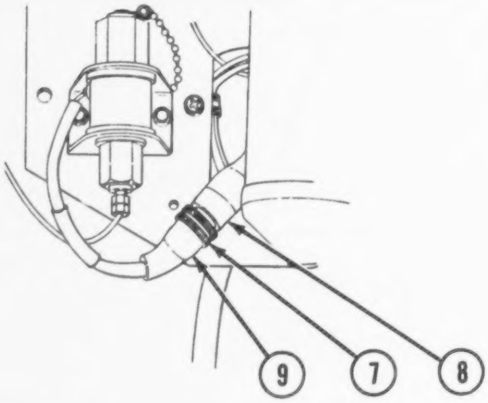
Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.



1. REMOVE ETHER FUEL CYLINDER FROM VALVE BODY AND CLAMP. (SEE COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM, PAGE 15-4.)
2. REMOVE CLAMP AND P45/J45 CONNECTION FROM FUEL FILTER BRACKET.
   - Remove self-locking nut (1), washer (2), screw (3), and clamp (4) with P45/J45 connection (5) from fuel filter bracket (6). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench. Discard self-locking nut.
   - Remove clamp (4) from P45/J45 connection (5).
   - Tag and mark leads.

---

3. TURN CONNECTOR SLEEVE (7), AND DISCONNECT CONNECTOR P45 (8) FROM RECEPTACLE J45 (9).



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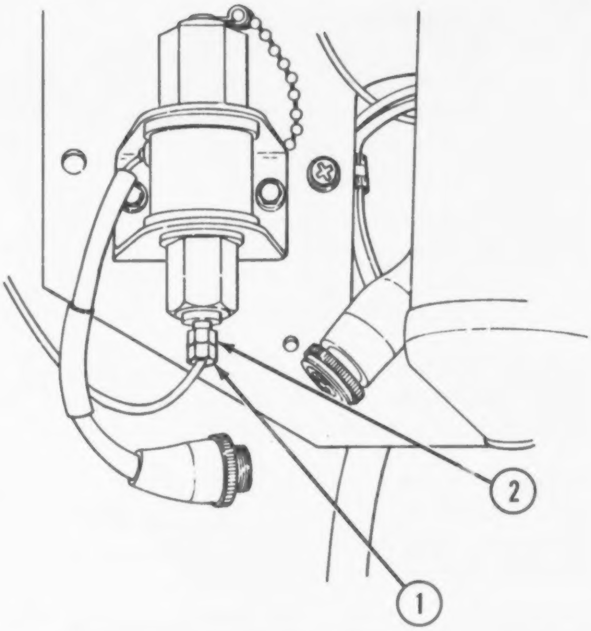
## E. COLD START ASSEMBLY REMOVAL — Continued

4. DISCONNECT ETHER TANK TO AIR INTAKE TUBE FROM ACTUATOR VALVE ASSEMBLY.
   - Disconnect ether tube (1) from actuator valve (2). Use 7/16 inch and 3/8 inch open end wrenches.



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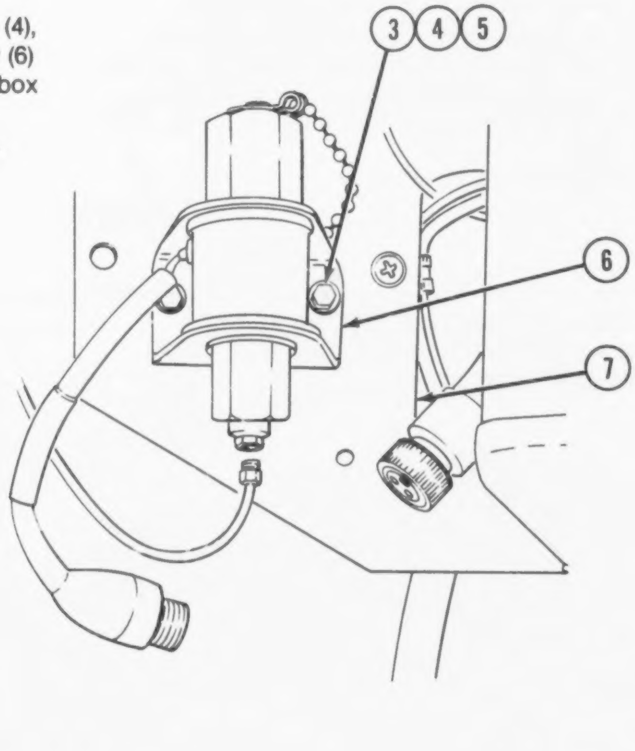
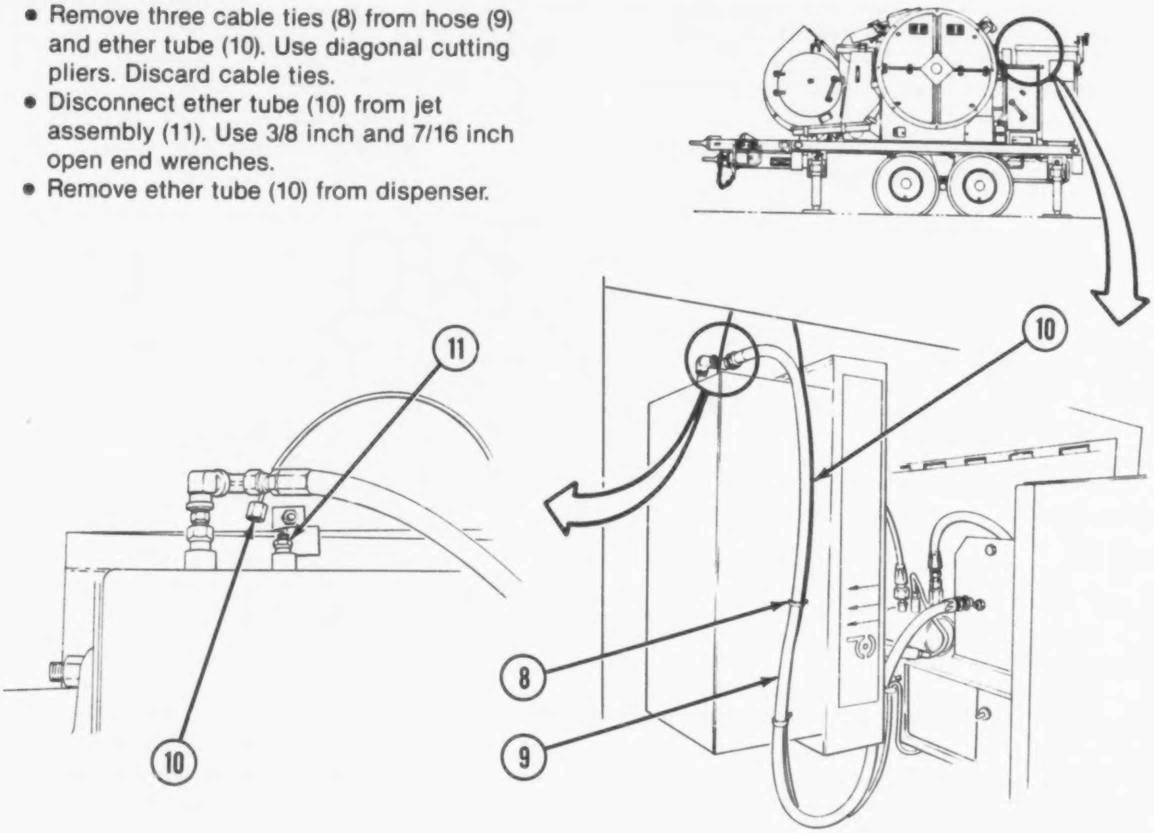
5. REMOVE ACTUATOR VALVE ASSEMBLY FROM FUEL FILTER BRACKET.
   - Remove two self-locking nuts (3), screws (4), washers (5), and actuator valve assembly (6) from fuel filter bracket (7). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard self-locking nuts.



6. REMOVE ETHER TANK TO AIR INTAKE TUBE FROM DISPENSER.
   - Remove three cable ties (8) from hose (9) and ether tube (10). Use diagonal cutting pliers. Discard cable ties.
   - Disconnect ether tube (10) from jet assembly (11). Use 3/8 inch and 7/16 inch open end wrenches.
   - Remove ether tube (10) from dispenser.



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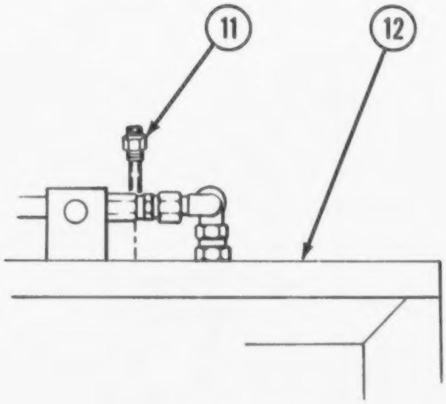
7. REMOVE ETHER INJECTION JET ASSEMBLY FROM AIR FILTER HOUSING.
   - Remove jet assembly (11) from filter housing (12). Use 7/16 inch box end wrench.



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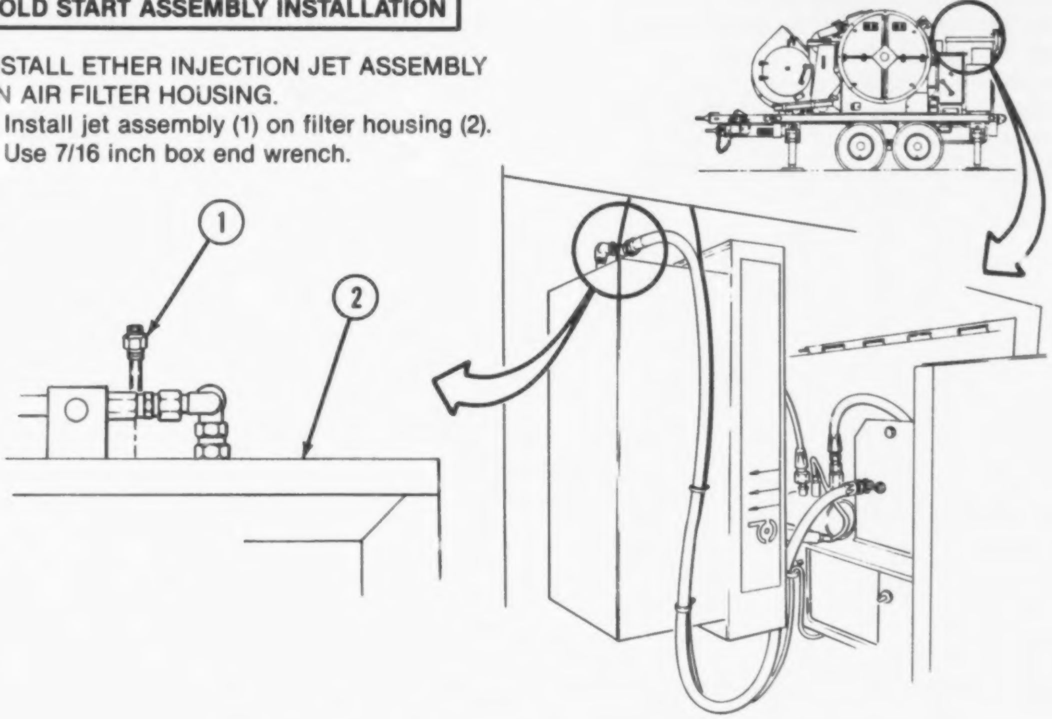
## 15-4 COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM — Continued

### F. COLD START ASSEMBLY INSTALLATION

1. INSTALL ETHER INJECTION JET ASSEMBLY ON AIR FILTER HOUSING.
   - Install jet assembly (1) on filter housing (2). Use 7/16 inch box end wrench.



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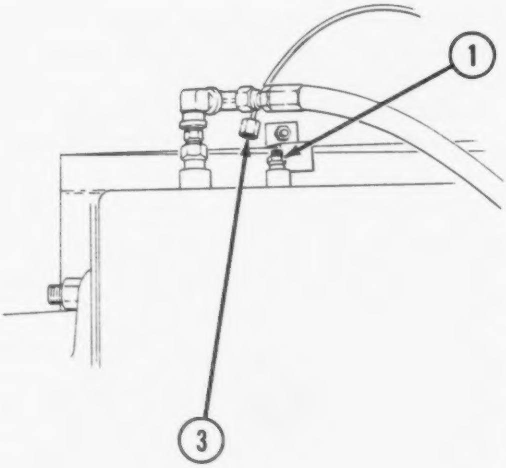
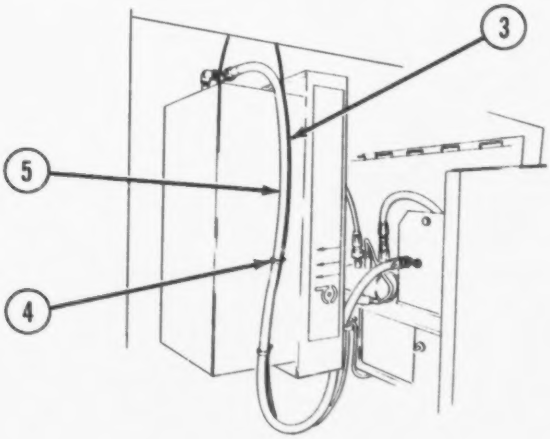
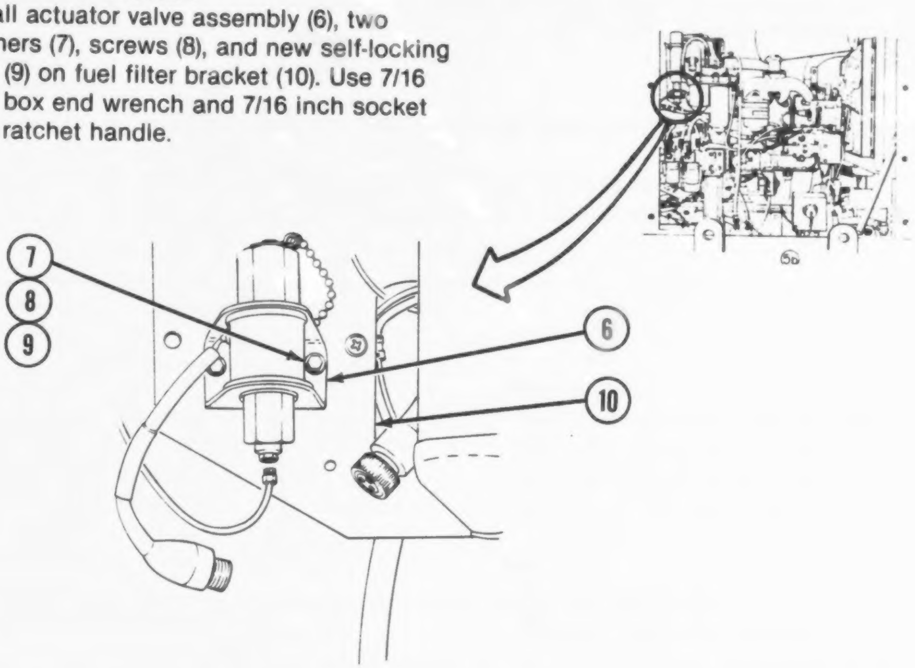
2. INSTALL ETHER TANK TO AIR INTAKE TUBE ON DISPENSER.
   - Connect ether tube (3) to jet assembly (1). Use 3/8 inch and 7/16 inch open end wrenches.
   - Install three new cable ties (4) on hose (5) and ether tube (3). Use round nose pliers.

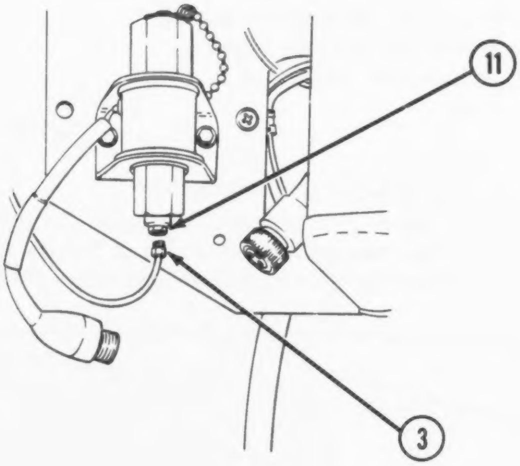




3. INSTALL ACTUATOR VALVE ASSEMBLY ON FUEL FILTER BRACKET.
   - Install actuator valve assembly (6), two washers (7), screws (8), and new self-locking nuts (9) on fuel filter bracket (10). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle.



4. CONNECT ETHER TANK TO AIR INTAKE TUBE TO ACTUATOR VALVE ASSEMBLY.
   - Connect ether tube (3) to actuator valve (11). Use 7/16 inch and 3/8 inch open end wrenches.



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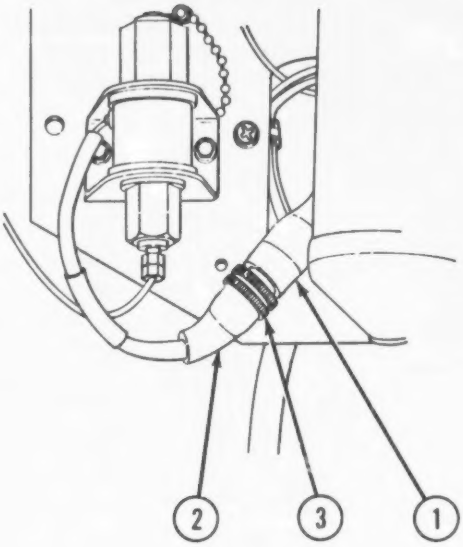
## F. COLD START ASSEMBLY INSTALLATION — Continued

5. CONNECT CONNECTOR P45 (1) TO RECEPTACLE J45 (2), AND TURN CONNECTOR SLEEVE (3).



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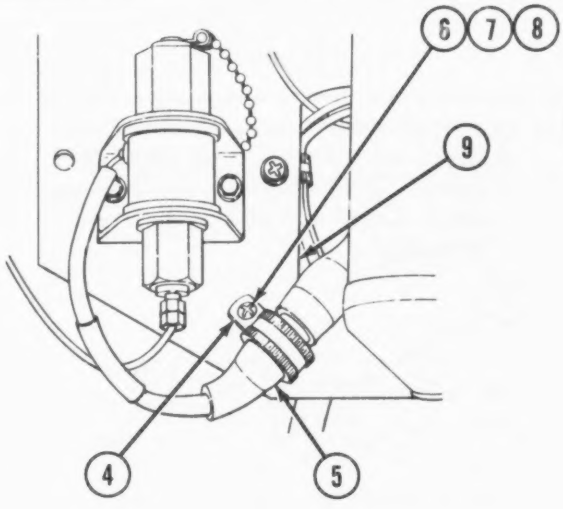
6. INSTALL CLAMP AND P45/J45 CONNECTION ON FUEL FILTER BRACKET.
   - Remove tags from leads.
   - Place clamp (4) on P45/J45 connection (5).
   - Install clamp (4) with P45/J45 connection (5), screw (6), washer (7), and new self-locking nut (8) on fuel filter bracket (9). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench.

7. INSTALL ETHER FUEL CYLINDER ON VALVE BODY AND CLAMP. (SEE COLD START ASSEMBLY AND AIR FILTER SERVICE INDICATOR SYSTEM, PAGE 15-5.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-5 SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY

### DESCRIPTION

This task covers:
- A. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY REMOVAL (p 15-15)
- B. SPEED CONTROL TRANSMITTER TEST (p 15-17)
- C. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY INSTALLATION (p 15-19)

---

### INITIAL SETUP

***Tools and Special Tools:***
- General mechanic's tool kit
  - 5180-00-177-7033:
    - 1/2 inch open end wrench
    - 7/16 inch box end wrench
    - 7/16 inch socket
    - 5 inch extension
    - Ratchet handle
- Multimeter 6625-00-999-6282

***Materials/Parts:***
- Preformed packing (96906) MS28775-215
- Self-locking nut (4) 5310-00-088-1251
- Lock washer (2) 5310-00-407-9566
- Rags, Item 22, Appendix B

***References:***
- TM 9-1095-205-10
- TM 9-1095-205-20

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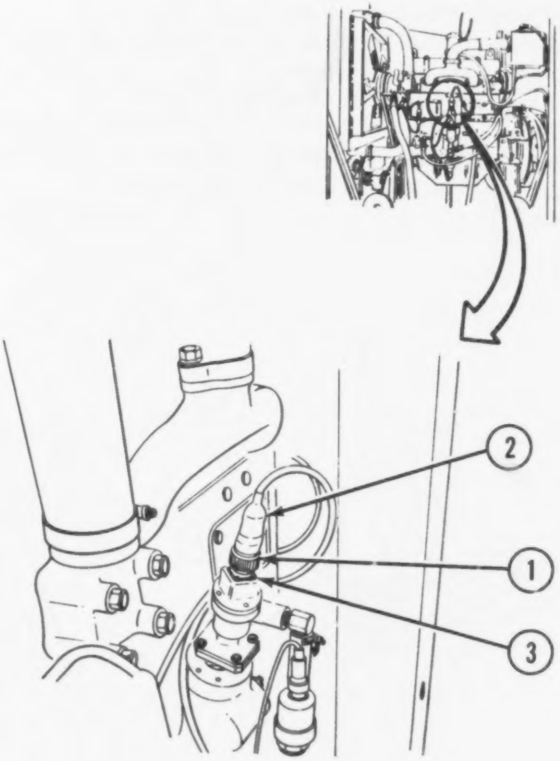
### A. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
- Open Right Battery Box Cover. (See TM 9-1095-205-10.)
- Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
- Remove Engine Fixed Panel. (See TM 9-1095-205-20.)

1. TURN CONNECTOR SLEEVE (1), AND DISCONNECT CONNECTOR P7 (2) FROM RECEPTACLE J7 (3).



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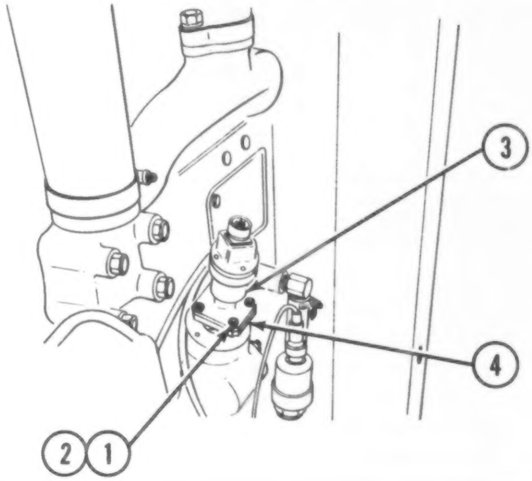
## A. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY REMOVAL — Continued

2. REMOVE SPEED CONTROL TRANSMITTER FROM ADAPTER ASSEMBLY RELAY MOUNTING BRACKET.
   - Remove four self-locking nuts (1) and screws (2) from transmitter (3). Use 7/16 inch box end wrench and 7/16 inch socket with 5 inch extension and ratchet handle. Discard self-locking nuts.
   - Lift transmitter (3) straight out of mounting bracket (4).



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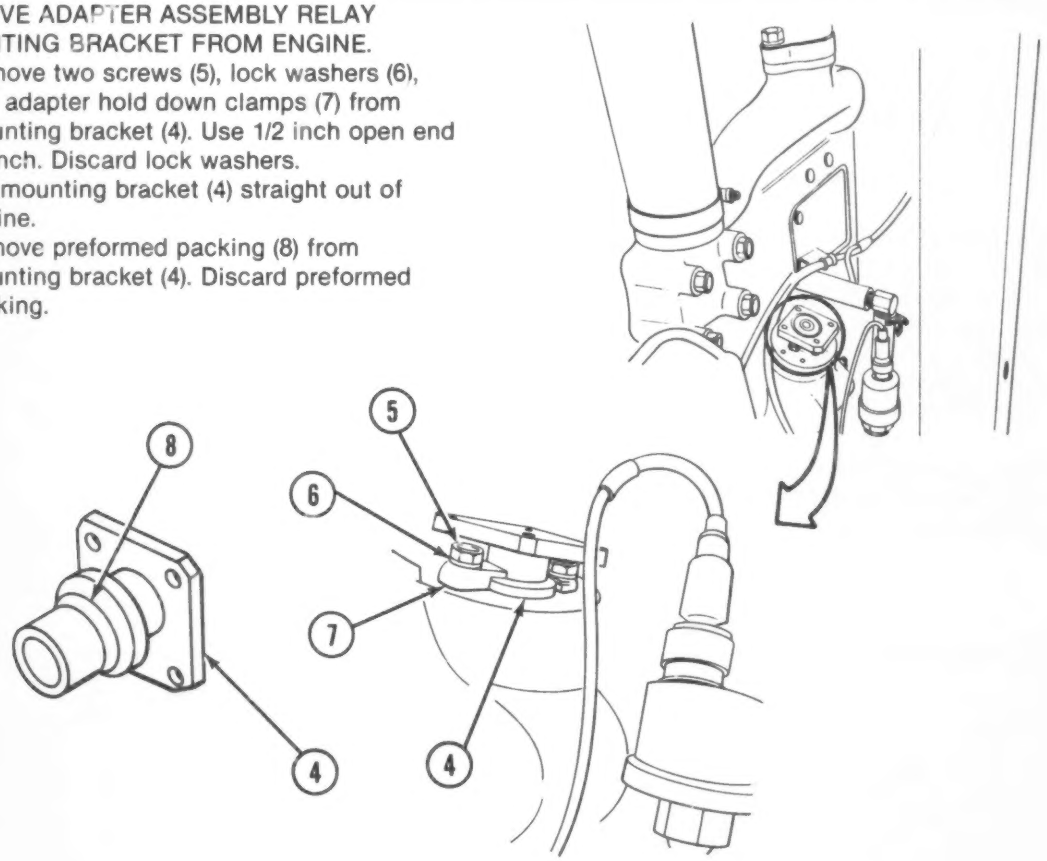
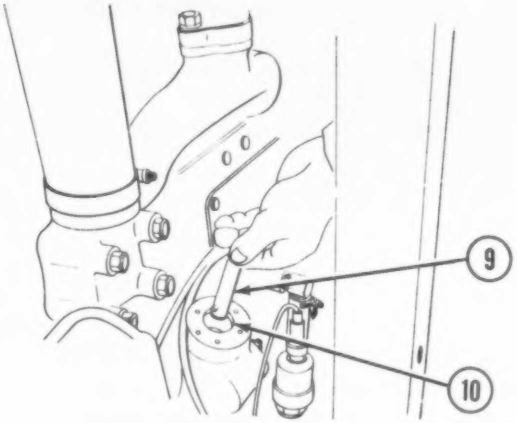
3. REMOVE ADAPTER ASSEMBLY RELAY MOUNTING BRACKET FROM ENGINE.
   - Remove two screws (5), lock washers (6), and adapter hold down clamps (7) from mounting bracket (4). Use 1/2 inch open end wrench. Discard lock washers.
   - Lift mounting bracket (4) straight out of engine.
   - Remove preformed packing (8) from mounting bracket (4). Discard preformed packing.



4. REMOVE SPEED CONTROL SHAFT ASSEMBLY FROM SHAFT OPENING.
   - Lift shaft assembly (9) straight out of shaft opening (10).
   - Place clean rags in shaft opening (10).



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## B. SPEED CONTROL TRANSMITTER TEST

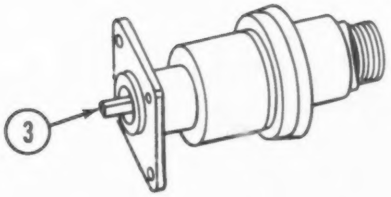
**NOTE**

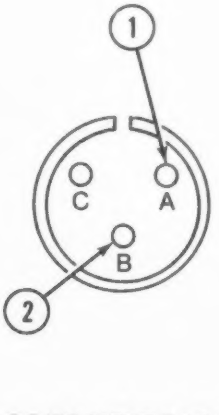
***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)

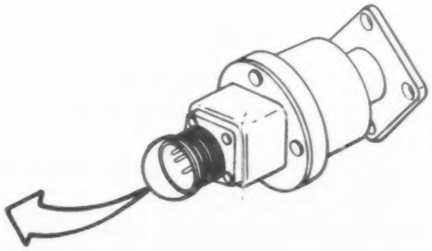
1. TURN CONNECTOR SLEEVE, AND DISCONNECT CONNECTOR P7 FROM RECEPTACLE J7. (SEE SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, PAGE 15-15.)

2. REMOVE SPEED CONTROL TRANSMITTER FROM ADAPTER ASSEMBLY RELAY MOUNTING BRACKET. (SEE SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, PAGE 15-16.)

3. SET SPEED CONTROL TRANSMITTER SHAFT ASSEMBLY.
   - Position multimeter (+) probe on Pin A (1).
   - Position multimeter (–) probe on Pin B (2).
   - Set multimeter for ohms.
   - Turn shaft (3) until multimeter needle reads minimum ohms.







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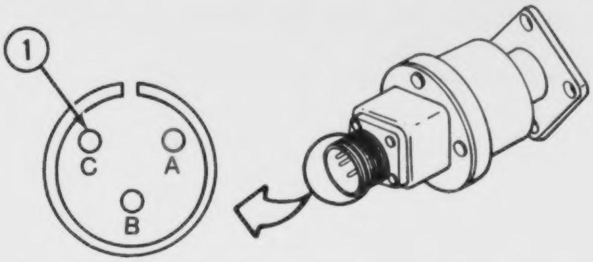
## B. SPEED CONTROL TRANSMITTER TEST—Continued

4. TEST SPEED CONTROL TRANSMITTER.
   - Move multimeter (+) probe to Pin C (1).
   - Multimeter should read maximum ohms.



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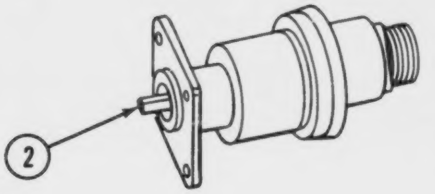
5. RESET SPEED CONTROL TRANSMITTER SHAFT ASSEMBLY.
   - Turn shaft (2) until multimeter reads minimum ohms.



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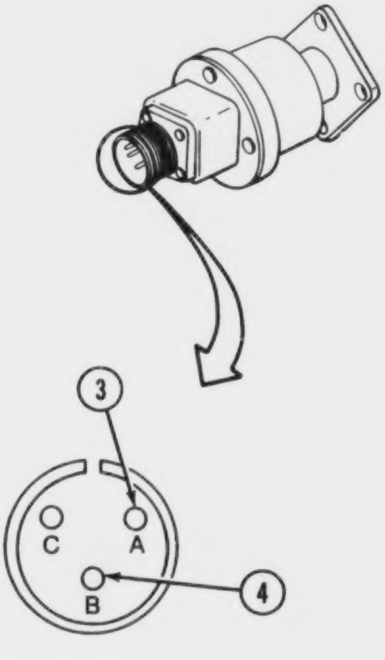
6. RETEST SPEED CONTROL TRANSMITTER.
   - Move multimeter (+) probe to Pin A (3).
   - Multimeter should read maximum ohms.
   - Remove multimeter (+) probe from Pin A (3).
   - Remove multimeter (−) probe from Pin B (4).

7. INSTALL SPEED CONTROL TRANSMITTER ON ADAPTER ASSEMBLY RELAY MOUNTING BRACKET. (SEE SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, PAGE 15-20.)

8. CONNECT CONNECTOR P7 TO RECEPTACLE J7, AND TURN CONNECTOR SLEEVE. (SEE SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, PAGE 15-20.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Engine Fixed Panel. (See TM 9-1095-205-20.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

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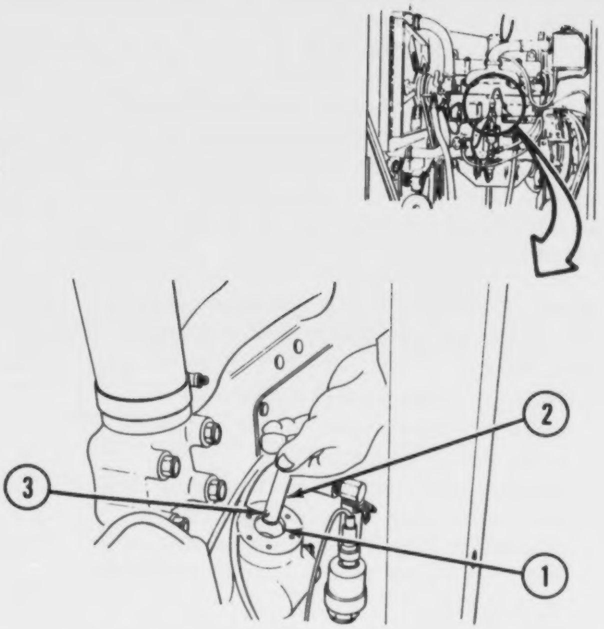
## C. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY INSTALLATION

1. INSTALL SPEED CONTROL SHAFT ASSEMBLY IN SHAFT OPENING.
   - Remove rags from shaft opening (1).
   - Position shaft assembly (2) in shaft opening (1).
   - Turn shaft assembly (2) until spring pin (3) drops into slotted gear in engine, and shaft assembly (2) locks.



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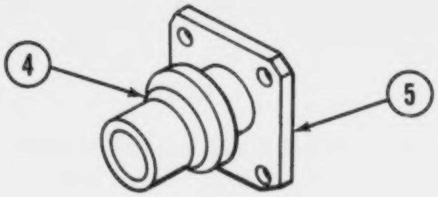
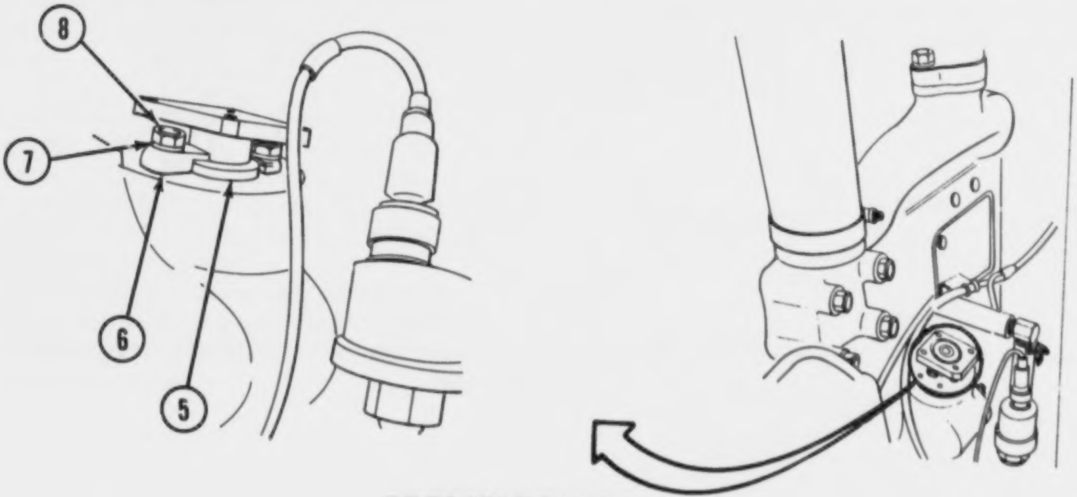
2. INSTALL ADAPTER ASSEMBLY RELAY MOUNTING BRACKET ON ENGINE.
   - Apply light coat of oil to new preformed packing (4).
   - Install preformed packing (4) on mounting bracket (5).
   - Install mounting bracket (5), two adapter hold down clamps (6), new lock washers (7), and screws (8) on engine. Use 1/2 inch open end wrench.





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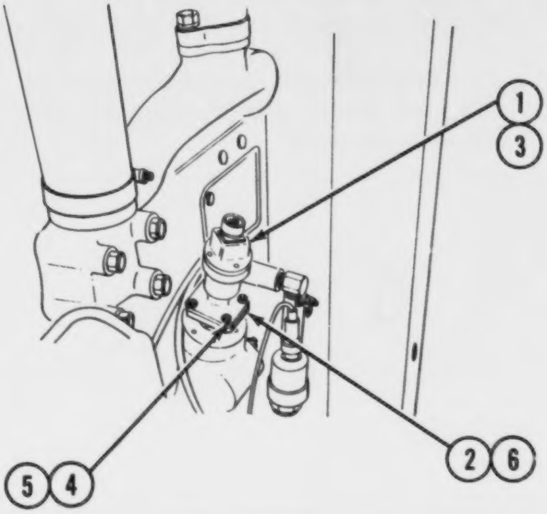
## C. SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY INSTALLATION — Continued

**CAUTION**

Speed control transmitter will be damaged if its shaft is forced into speed control shaft assembly. Transmitter shaft is square. Use care when you position it in square sleeve of speed control shaft assembly.

3. INSTALL SPEED CONTROL TRANSMITTER ON ADAPTER ASSEMBLY RELAY MOUNTING BRACKET.
   - Position speed control transmitter shaft assembly (1) in square sleeve of speed control shaft assembly (2).
   - Install transmitter (3), four screws (4), and new self-locking nuts (5) on mounting bracket (6). Use 7/16 box end wrench and 7/16 inch socket with 5 inch extension and ratchet handle.



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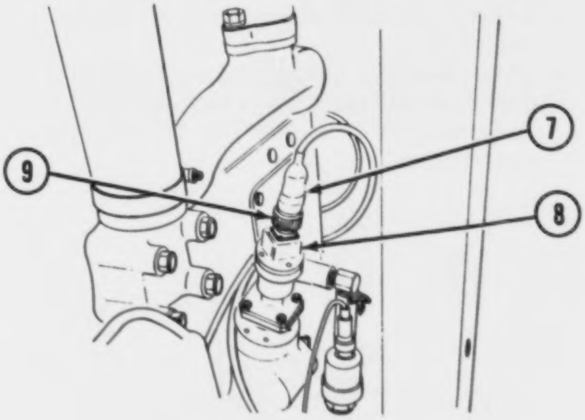
4. CONNECT CONNECTOR P7 (7) TO RECEPTACLE J7 (8), AND TURN CONNECTOR SLEEVE (9).

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Engine Fixed Panel. (See TM 9-1095-205-20.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)



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END OF TASK

## 15-6 INTAKE MANIFOLD

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-21)
B. INSTALLATION (p 15-22)

### INITIAL SETUP

***Tools and Special Tools:***
- General mechanic's tool kit 5180-00-177-7033:
  - 9/16 inch socket
  - 10 inch extension
  - Ratchet handle
  - Putty knife
- Scratch wire brush 7920-00-291-5815
- Torque wrench 5120-00-640-6364

***Materials/Parts:***
- Lock washers (4) 5310-00-209-0920
- Gasket (2) 5330-00-291-8972
- Solvent, Item 28, Appendix B
- Rags, Item 22, Appendix B

***Reference:***
- TM 9-1095-205-20

### A. REMOVAL

**NOTE**

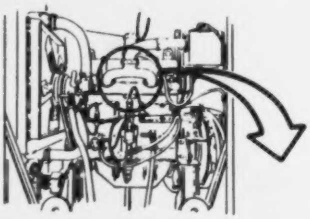
***PRELIMINARY PROCEDURES:***
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)
Remove Air Cleaner Filter Element. (See TM 9-1095-205-20.)
Remove Air Filter Housing. (See TM 9-1095-205-20.)
Remove Air Intake Pipe. (See TM 9-1095-205-20.)

**WARNING**

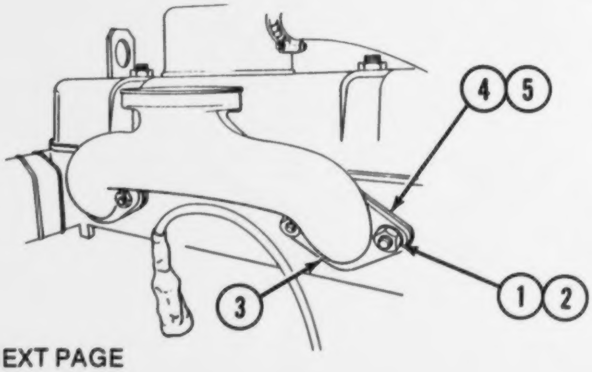
Cleaning solvent can explode and can burn. Read warning on front page of this manual.

**CAUTION**

Engine can be damaged if foreign objects fall into ports. Put rags in ports to protect engine.



REMOVE INTAKE MANIFOLD FROM ENGINE.
- Remove four nuts (1), lock washers (2), manifold (3), and two gaskets (4) from engine. Use 9/16 inch socket with 10 inch extension and ratchet handle. Discard lock washers and gaskets.
- Place clean rags in two engine ports (5).
- Clean gasket mating surfaces on manifold (3) and engine. Use putty knife, wire brush, rags, and solvent.



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## 15-6 INTAKE MANIFOLD — Continued

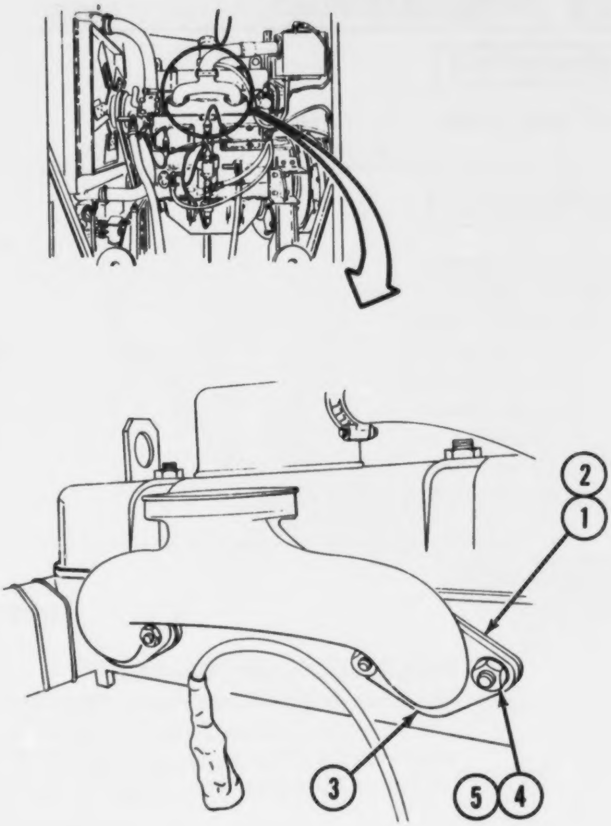
### B. INSTALLATION

**NOTE**

Torque two center nuts first and then two outer nuts.

INSTALL INTAKE MANIFOLD ON ENGINE.

- Remove rags from two engine ports (1).
- Install two new gaskets (2), manifold (3), four new lock washers (4), and nuts (5) on engine. Do not tighten. Use 9/16 inch socket and 10 inch extension with ratchet handle.
- Torque four nuts (5) to 30 — 40 ft lb (2.8 — 5.5 mkg). Use 9/16 inch socket with 10 inch extension and torque wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Air Intake Pipe. (See TM 9-1095-205-20.)
Install Air Filter Housing. (See TM 9-1095-205-20.)
Install Air Cleaner Filter Element. (See TM 9-1095-205-20.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)

---

END OF TASK

## 15-7 EXHAUST MANIFOLD

**DESCRIPTION**

This task covers:
A. REMOVAL (p 15-23)
B. INSTALLATION (p 15-26)

**INITIAL SETUP**

***Tools and Special Tools:***
- General mechanic's tool kit 5180-00-177-7033:
  - 3/8 inch box end wrench
  - 5/8 inch socket
  - 5 inch extension
  - No. 2 cross tip screwdriver
  - Ratchet handle
  - Putty knife
  - Aligning punch
- Torque wrench 5120-00-640-6364
- Scratch wire brush 7920-00-291-5815
- No. 2 offset cross tip screwdriver 5120-00-256-9014

***Materials/Parts:***
- Gasket (4) 5330-00-171-7034
- Lock washer (3) 5310-00-209-0965
- Self-locking nut (3) 5310-00-877-5797
- Solvent, Item 28, Appendix B
- Rags, Item 22, Appendix B

***Personnel Required:***
- Mechanic
- Helper

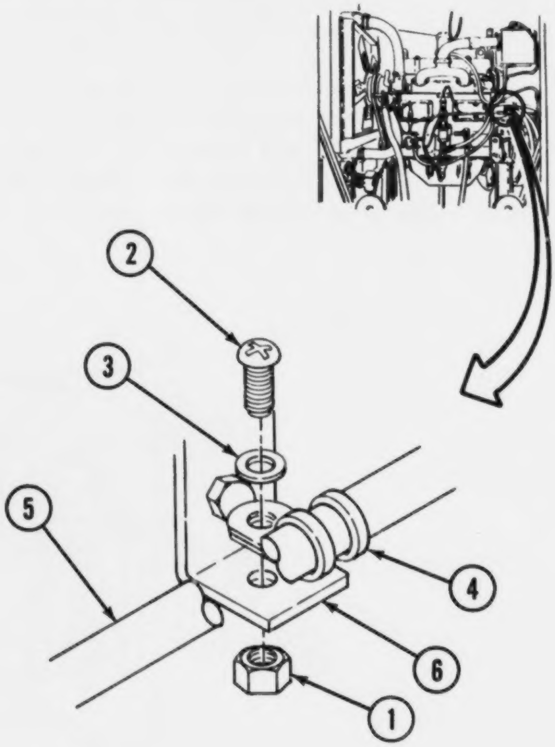
***References:***
- TM 9-1095-205-10
- TM 9-1095-205-20

**A. REMOVAL**

**NOTE**

***PRELIMINARY PROCEDURES:***
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Muffler. (See TM 9-1095-205-20.)

1. REMOVE ENGINE WIRING HARNESS AND CLAMP FROM REAR ENGINE BRACKET.
   - Remove self-locking nut (1), screw (2), washer (3), and clamp (4) with wiring harness (5) from bracket (6). Use 3/8 inch box end wrench and No. 2 cross tip screwdriver. Discard self-locking nut.



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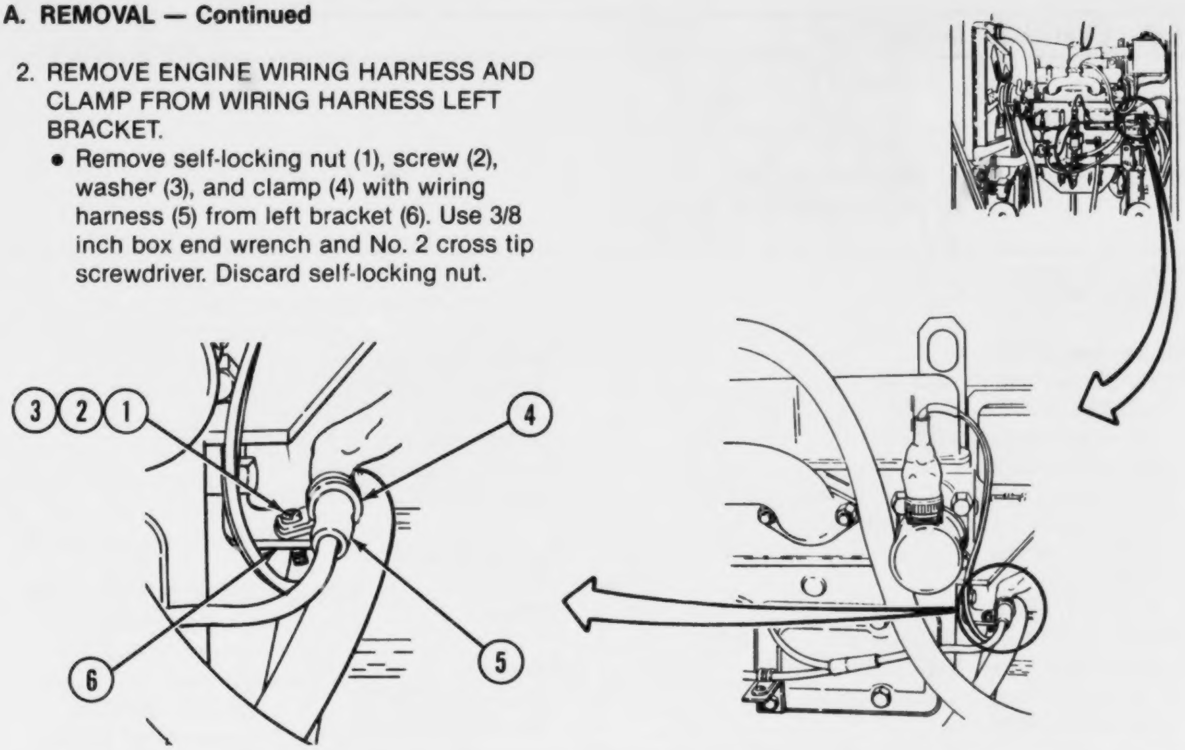
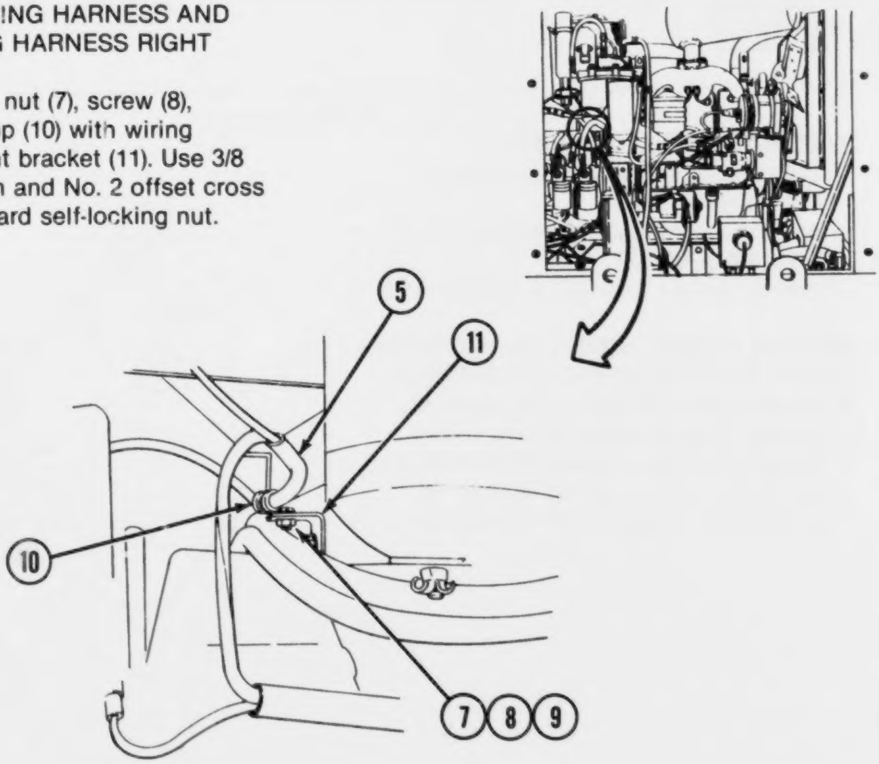
## A. REMOVAL — Continued

2. REMOVE ENGINE WIRING HARNESS AND CLAMP FROM WIRING HARNESS LEFT BRACKET.
   - Remove self-locking nut (1), screw (2), washer (3), and clamp (4) with wiring harness (5) from left bracket (6). Use 3/8 inch box end wrench and No. 2 cross tip screwdriver. Discard self-locking nut.



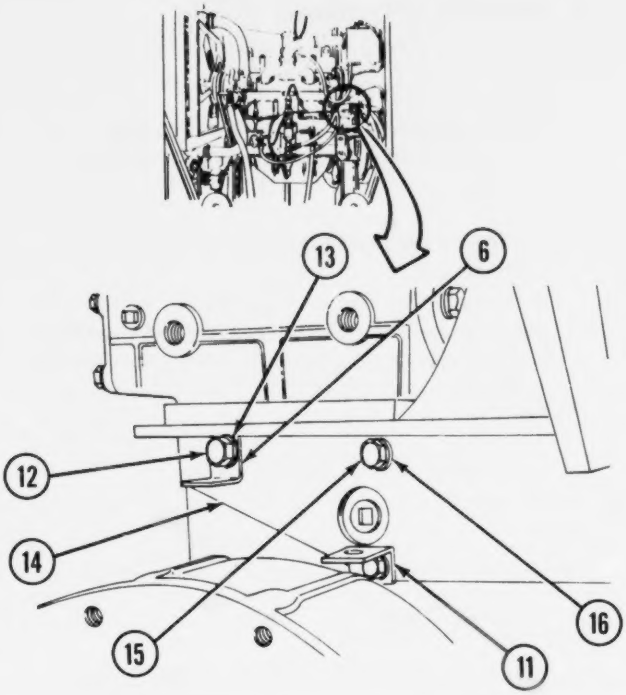
3. REMOVE ENGINE WIRING HARNESS AND CLAMP FROM WIRING HARNESS RIGHT BRACKET.
   - Remove self-locking nut (7), screw (8), washer (9), and clamp (10) with wiring harness (5) from right bracket (11). Use 3/8 inch box end wrench and No. 2 offset cross tip screwdriver. Discard self-locking nut.



**CAUTION**

Filter bracket assembly can fall and be damaged when the last screw is removed. Hold filter bracket assembly while removing last screw.

4. REMOVE FUEL FILTER BRACKET ASSEMBLY FROM ENGINE.
   - Remove screw (12), lock washer (13), and left bracket (6) from bracket assembly (14). Use 5/8 inch socket with 5 inch extension and ratchet handle. Discard lock washers.
   - Repeat above removal step for right bracket (11).
   - Remove screw (15), lock washer (16), and bracket assembly (14) from engine. Use 5/8 inch socket and 5 inch extension with ratchet handle. Use helper. Discard lock washer.



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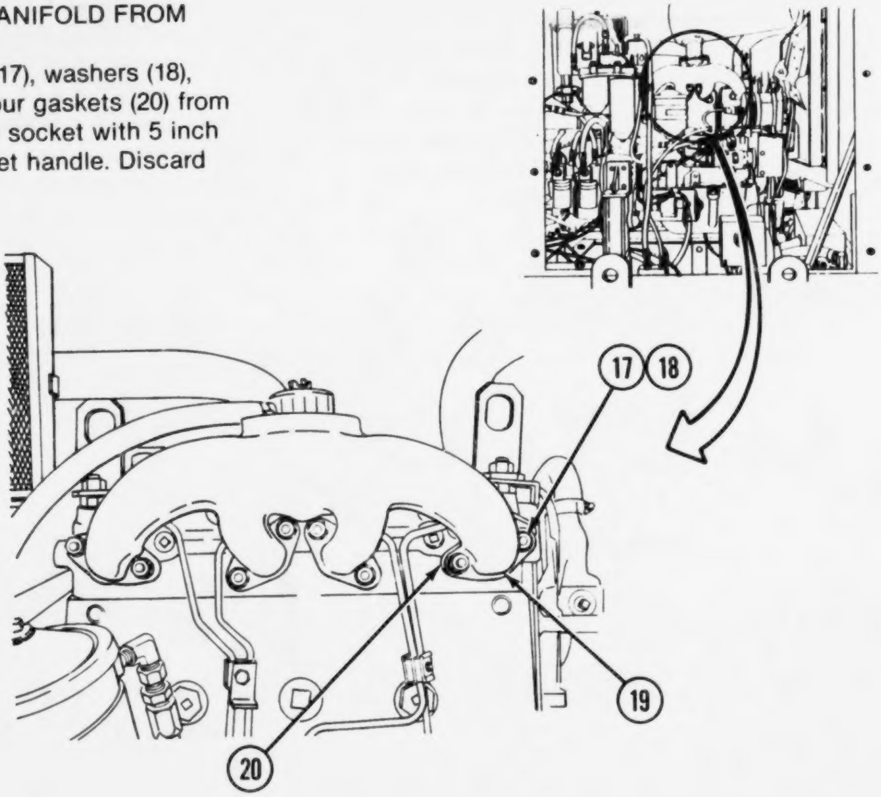
5. REMOVE EXHAUST MANIFOLD FROM ENGINE.
   - Remove eight nuts (17), washers (18), manifold (19), and four gaskets (20) from engine. Use 5/8 inch socket with 5 inch extension and ratchet handle. Discard gaskets.



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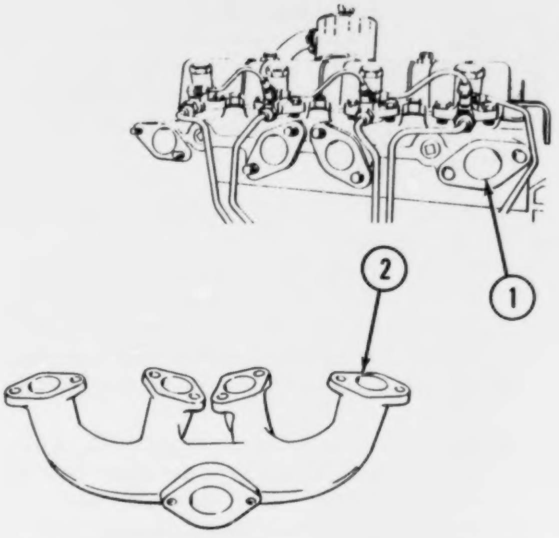
## A. REMOVAL — Continued

**WARNING**

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

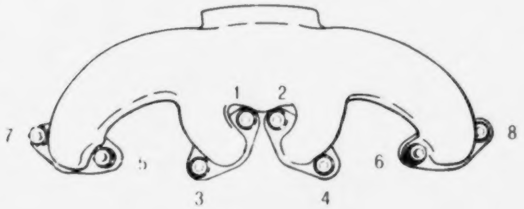


6. CLEAN MANIFOLD GASKET MATING SURFACES.
   - Place clean rags in four engine ports (1).
   - Clean gasket mating surfaces on manifold (2) and engine. Use putty knife, wire brush, solvent, and rag.

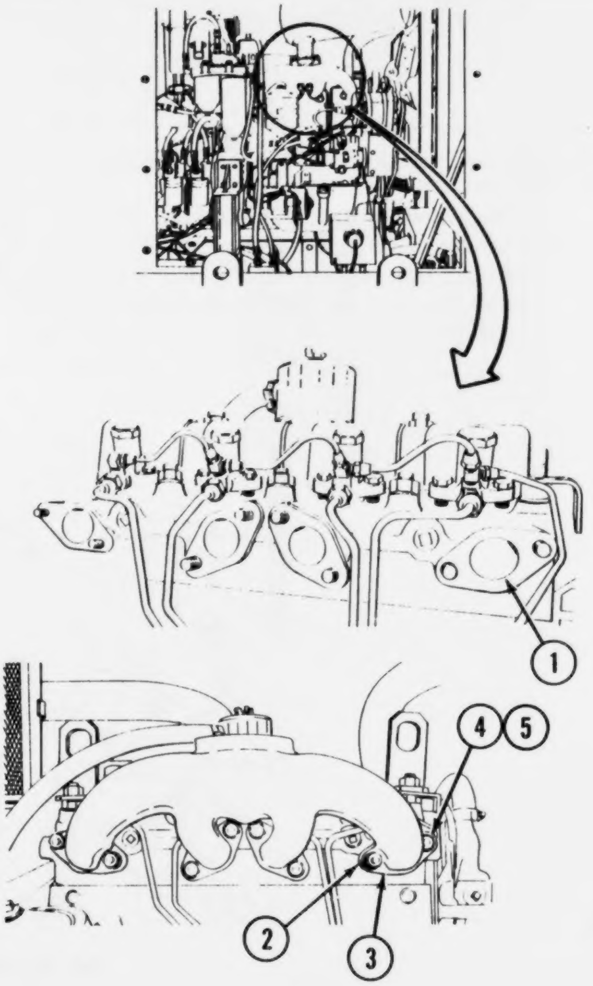
---

## B. INSTALLATION

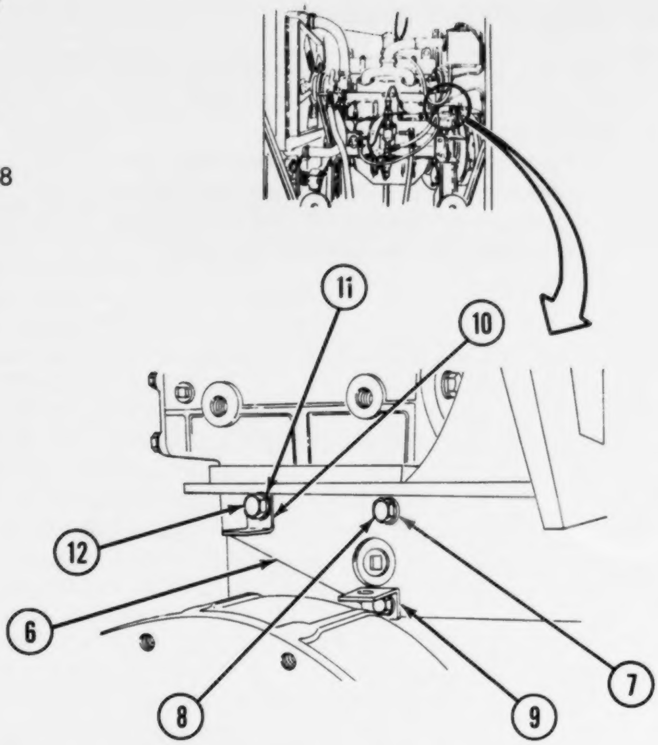
1. INSTALL EXHAUST MANIFOLD ON ENGINE.
   - Remove rags from four engine ports (1).
   - Install four new gaskets (2), manifold (3), eight washers (4), and nuts (5) on engine. Use 5/8 inch socket with 5 inch extension and ratchet handle. Do not tighten.
   - Torque eight nuts (5) to 30 — 40 ft lb (2.8 — 5.5 mkg). Use 5/8 inch socket with 5 inch extension and torque wrench. (See following Torquing Sequence.)



*Torquing Sequence*



2. INSTALL FUEL FILTER BRACKET ASSEMBLY ON ENGINE.
   - Position bracket assembly (6) on engine, with mounting holes alined. Use aligning punch. Use helper.
   - Install bracket assembly (6), new lock washer (7), and screw (8) on engine. Use 5/8 inch socket with 5 inch extension and ratchet handle.
   - Install two brackets (9) (10), new lock washers (11), and screws (12) on bracket assembly (6). Use 5/8 inch socket with 5 inch extension and ratchet handle.



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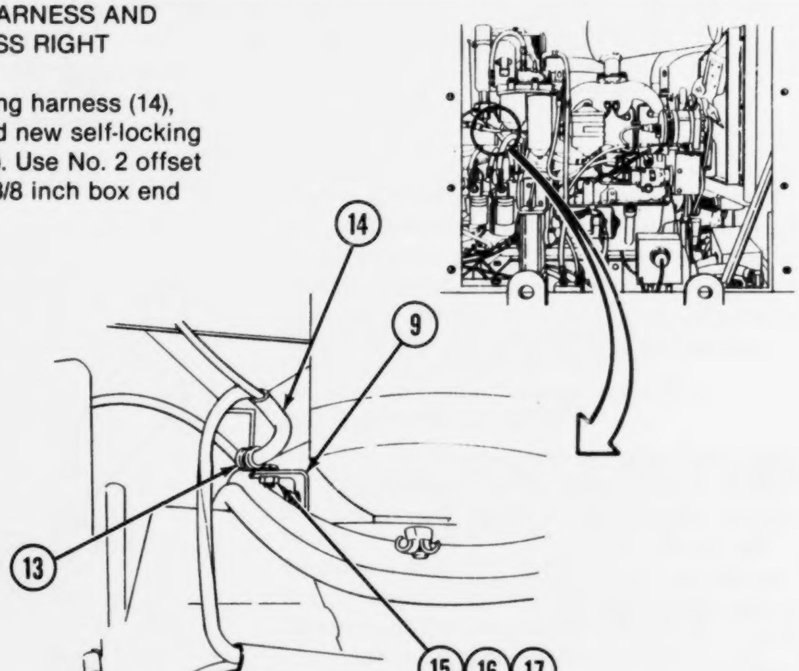
3. INSTALL ENGINE WIRING HARNESS AND CLAMP ON WIRING HARNESS RIGHT BRACKET.
   - Install clamp (13) with wiring harness (14), washer (15), screw (16), and new self-locking nut (17) on right bracket (9). Use No. 2 offset cross tip screwdriver and 3/8 inch box end wrench.



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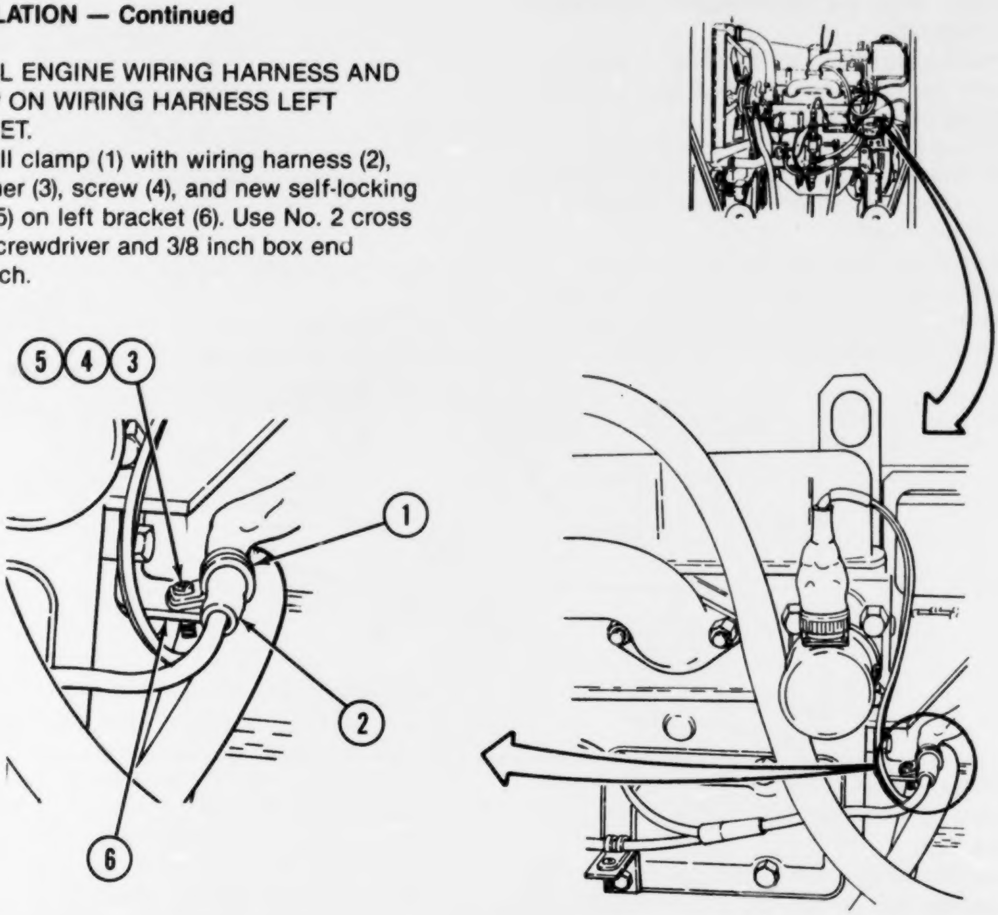
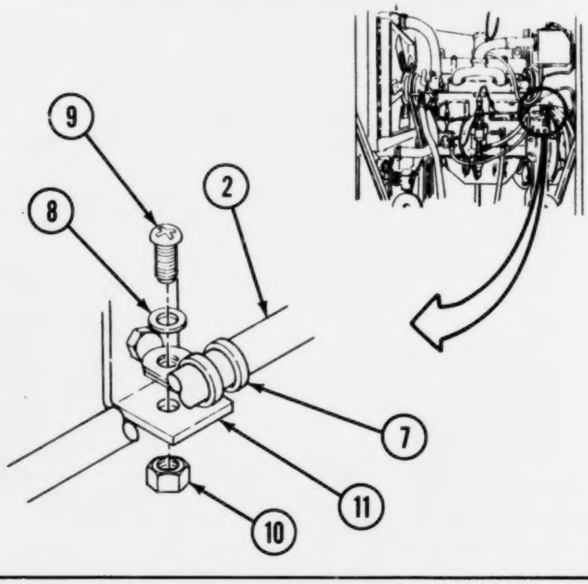
### B. INSTALLATION — Continued

4. INSTALL ENGINE WIRING HARNESS AND CLAMP ON WIRING HARNESS LEFT BRACKET.
   - Install clamp (1) with wiring harness (2), washer (3), screw (4), and new self-locking nut (5) on left bracket (6). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench.



5. INSTALL ENGINE WIRING HARNESS AND CLAMP ON REAR ENGINE BRACKET.
   - Install clamp (7) with wiring harness (2), washer (8), screw (9), and new self-locking nut (10) on bracket (11). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Muffler. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)

END OF TASK

## 15-8 ALTERNATOR

**DESCRIPTION**

This task covers:

A. ALTERNATOR TEST (p 15-30)
B. COVER AND CONNECTOR PLUG ASSEMBLY REMOVAL (p 15-42)
C. COVER AND CONNECTOR PLUG ASSEMBLY INSTALLATION (p 15-45)
D. FUSE HOLDER ASSEMBLY REMOVAL (p 15-47)
E. FUSE HOLDER ASSEMBLY INSTALLATION (p 15-48)
F. CONNECTOR PLUG ASSEMBLY REMOVAL (p 15-49)
G. CONNECTOR PLUG ASSEMBLY INSTALLATION (p 15-50)
H. VOLTAGE PROTECTOR REMOVAL (p 15-51)
I. VOLTAGE PROTECTOR INSTALLATION (p 15-52)
J. SHIELD AND ISOLATION DIODE ASSEMBLIES REMOVAL (p 15-52)
K. ISOLATION DIODE ASSEMBLY TEST (p 15-53)
L. SHIELD AND ISOLATION DIODE ASSEMBLIES INSTALLATION (p 15-55)
M. VOLTAGE REGULATOR ASSEMBLY REMOVAL (p 15-55)
N. VOLTAGE REGULATOR ASSEMBLY TEST (p 15-57)
O. VOLTAGE REGULATOR ASSEMBLY INSTALLATION (p 15-57)
P. BRUSH ASSEMBLY REMOVAL (p 15-58)
Q. BRUSH ASSEMBLY INSPECTION AND TEST (p 15-59)
R. BRUSH ASSEMBLY INSTALLATION (p 15-61)
S. STATOR ASSEMBLY AND REAR HOUSING REMOVAL (p 15-62)
T. STATOR ASSEMBLY DISASSEMBLY (p 15-63)
U. DIODE AND STATOR ASSEMBLIES TESTS (p 15-64)
V. STATOR ASSEMBLY REASSEMBLY (p 15-68)
W. STATOR ASSEMBLY AND REAR HOUSING INSTALLATION (p 15-69)
X. ROTOR ASSEMBLY REMOVAL (p 15-70)
Y. ROTOR ASSEMBLY TEST (p 15-72)
Z. ROTOR ASSEMBLY INSTALLATION (p 15-73)
AA. FRONT HOUSING DISASSEMBLY (p 15-74)
AB. FRONT HOUSING REASSEMBLY (p 15-75)

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**INITIAL SETUP**

***Tools and Special Tools:***

General mechanic's tool kit
  5180-00-177-7033:
    3/8 inch socket
    7/16 inch socket
    5 inch extension
    6 inch steel rule
    Ratchet handle
    3/8 inch open end wrench
    11/16 inch open end wrench
    1/4 inch flat tip screwdriver
    3/8 inch flat tip screwdriver
    Pocket knife
    Round nose pliers
Field rheostat

***Tools and Special Tools — Continued:***

Arbor press 3440-00-449-7295
Mechanical puller 5120-00-516-3120
Multimeter 6625-00-999-6282
50k ohm resistor
1/4 inch handled socket wrench 5120-00-241-3188
Soft faced hammer 5120-00-903-8555
Spring tester 6635-00-641-7346
Test stand 4190-00-767-0218
Torque wrench 5120-00-640-6364
Retaining ring pliers 5210-00-293-0045
1 inch deep socket 5120-00-243-7340
1/8 inch flat tip screwdriver 5120-00-236-2149

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

***Tools and Special Tools — Continued:***
Vise 5120-00-293-1439
Vise caps 5120-00-221-1506

***Materials/Parts:***
Nut with captive washer (4) (31211) 20-33
Lock washer (31211) 20-62
Lock washer (31211) 20-5
Self-tapping screw (2) (31211) 20-32
Shrinkable tubing

***Personnel Required:***
Electrical repairer

***References:***
TM 9-4910-663-12
TM 55-1500-323-25

## OVERVIEW

Perform Alternator Test (see page 15-30) before working on alternator. Alternator Test consists of the following alternator tests and checks:

- Ac/dc systems test (internal regulator/rectifier)
- Total circuit voltage check
- Positive output circuit test
- Negative output circuit test
- Excitation voltage test
- Output and voltage protector test
- Field current test.

Alternator Test isolates components to be repaired. Once repair action is completed, perform ac/dc systems test again to ensure problem is corrected.

Some tests require complete disassembly of alternator, to further locate problems. For complete disassembly of alternator, do subparagraphs B thru U. (See pages 15-42 thru 15-76.)

## A. ALTERNATOR TEST

**NOTE**

The alternator must be driven at speeds of 2000 — 4000 rpm during tests. A test stand, automotive generator, alternator and starter, or other means may be used to do this.

• • • •

Component circuit diagrams are shown as part of this procedure. Make up circuit wiring and test leads from test stand accessories.

**NOTE**

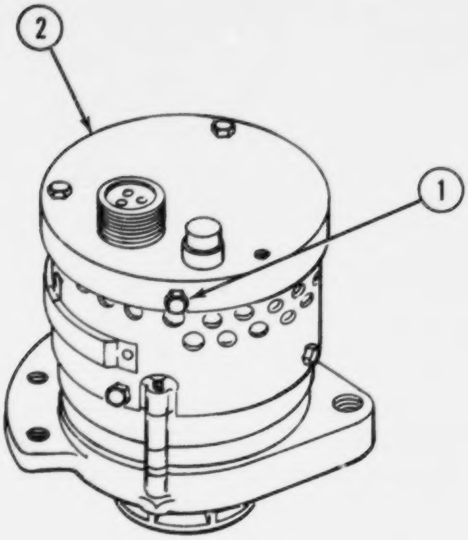
Alternator ac/dc systems test will determine if the alternator is capable of producing its minimum rated output. With alternator rotating at 4000 ± 100 rpm, output should be as follows:
Voltage: 28 ± 0.3 V dc.
Amperage: 30 ± 1 amp after 15 minutes.

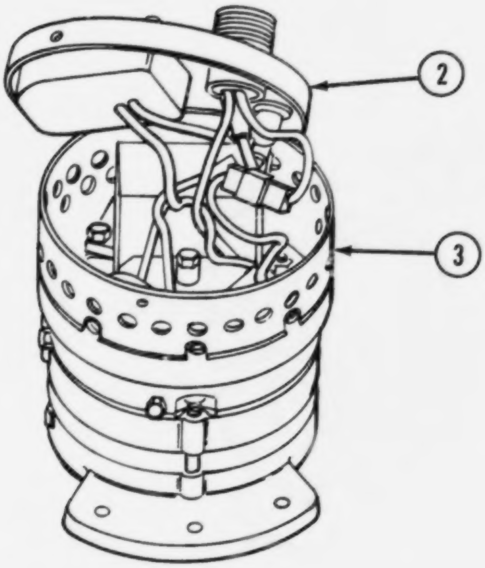
1. TEST AC/DC SYSTEMS (INTERNAL REGULATOR/RECTIFIER). (SEE TM 9-4910-663-12.) IF TEST RESULTS ARE NOT WITHIN LIMITS, GO TO STEP 2. IF TEST RESULTS ARE WITHIN LIMITS, ALTERNATOR IS NOT FAULTY.

**CAUTION**

Electrical leads can be easily damaged. Lift cover and connector plug assembly carefully to prevent damage to leads.

2. LIFT COVER AND CONNECTOR PLUG ASSEMBLY FROM SHIELD ASSEMBLY.
   - Remove three screws (1) from cover and connector plug assembly (2). Use 1/4 inch handled socket wrench.
   - Lift cover and connector plug assembly (2) from shield assembly (3).





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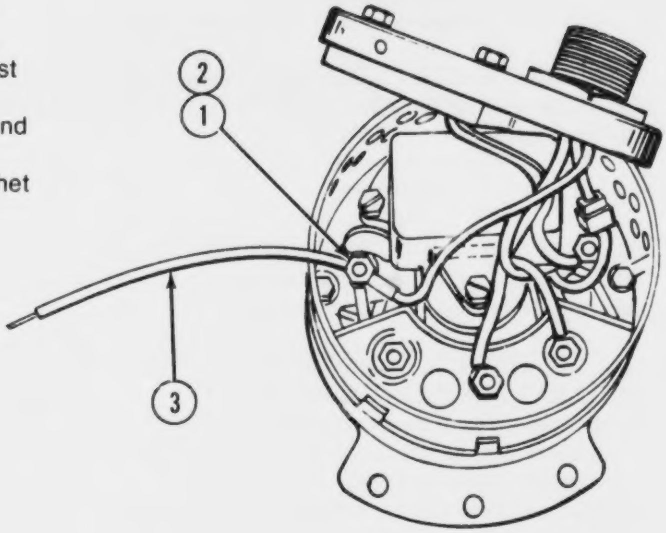
**A. ALTERNATOR TEST—Continued**

3. INSTALL THREE TEST LEADS ON ALTERNATOR.
   - Remove nut with captive washer (1) from auxiliary terminal (2). Use 3/8 inch socket with 5 inch extension and ratchet handle. Save nut with captive washer to install test lead (3).
   - Install 5 in. (12.7 cm) length test lead (3) and nut with captive washer (1) on auxiliary terminal (2). Use 3/8 inch socket with ratchet handle.



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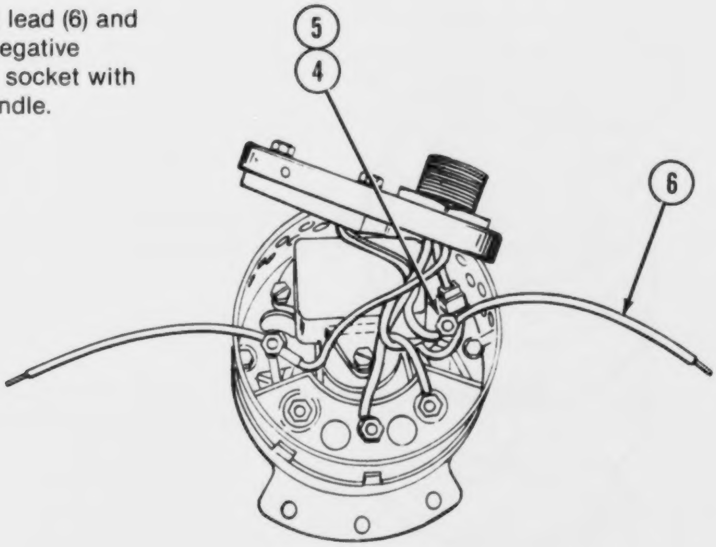
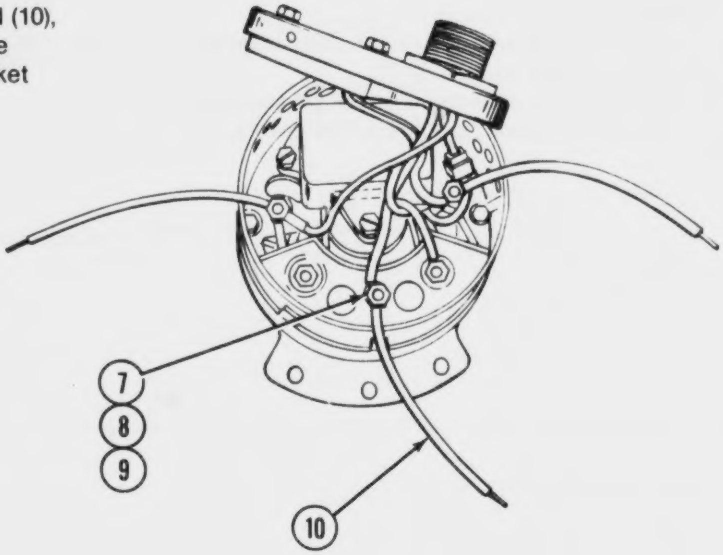
- Remove nut with captive washer (4) from negative output terminal (5). Use 3/8 inch socket with 5 inch extension and ratchet handle. Save nut with captive washer to install test lead (6).
- Install 5 in. (12.7 cm) length test lead (6) and nut with captive washer (4) on negative output terminal (5). Use 3/8 inch socket with 5 inch extension and ratchet handle.



- Remove nut (7) and lock washer (8) from positive output terminal (9). Use 7/16 inch socket with ratchet handle. Save lock washer to install test lead (10).
- Install 10 in. (25.4 cm) length test lead (10), lock washer (8), and nut (7) on positive output terminal (9). Use 7/16 inch socket with ratchet handle.



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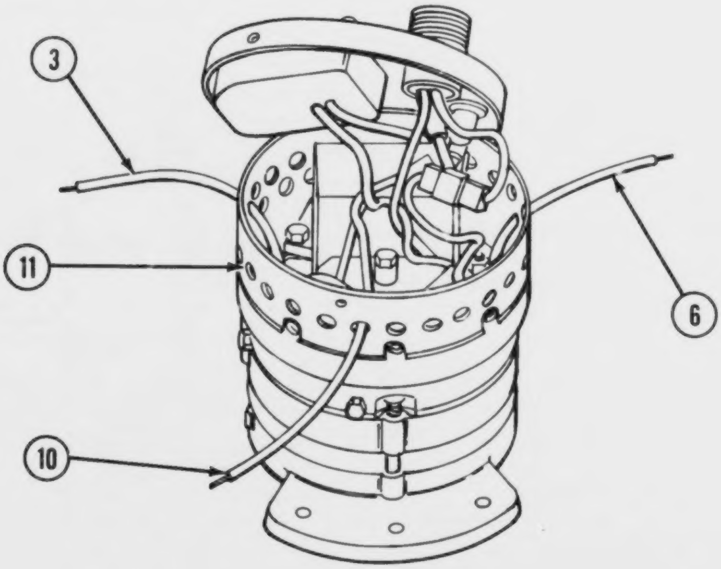
- Push test lead (3), test lead (6), and test lead (10) through holes in shield assembly (11).



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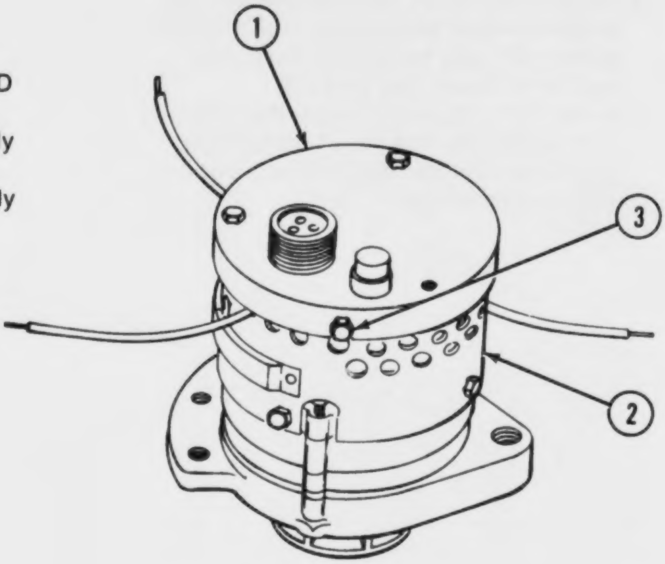
**A. ALTERNATOR TEST—Continued**

4. LOWER AND SECURE COVER AND CONNECTOR PLUG ASSEMBLY ON SHIELD ASSEMBLY.
   - Lower cover and connector plug assembly (1) on shield assembly (2).
   - Install three screws (3) on shield assembly (2). Use 1/4 inch handled socket wrench.



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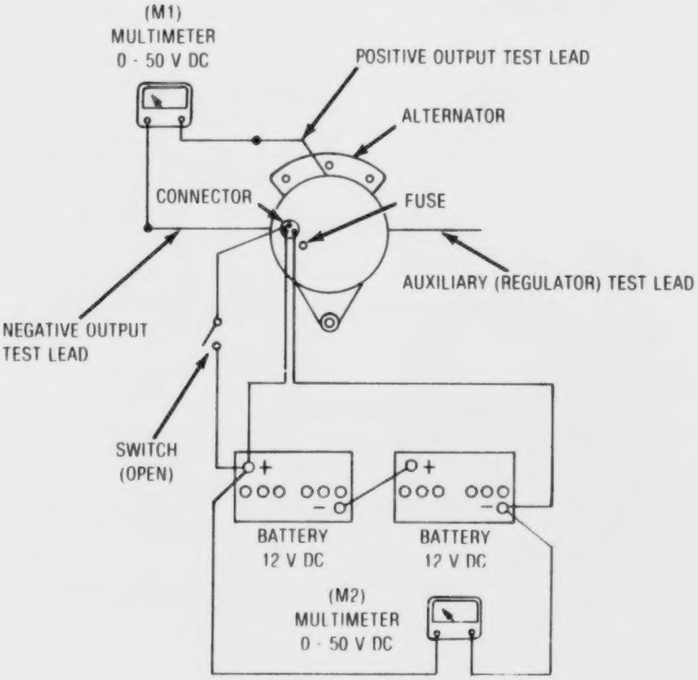
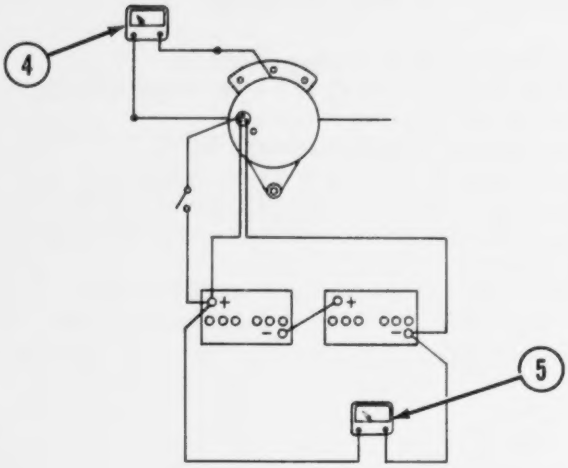
5. CHECK ALTERNATOR TOTAL CIRCUIT VOLTAGE.
   - Set up test equipment for total circuit voltage check. (See following Total Circuit Voltage Check Diagram.)


(M1)
MULTIMETER
0 - 50 V DC
POSITIVE OUTPUT TEST LEAD
ALTERNATOR
CONNECTOR
FUSE
AUXILIARY (REGULATOR) TEST LEAD
NEGATIVE OUTPUT
TEST LEAD
SWITCH
(OPEN)
+
−
BATTERY
12 V DC
BATTERY
12 V DC
(M2)
MULTIMETER
0 - 50 V DC

*Total Circuit Voltage Check Diagram*

- Check voltage reading at M1 (4) and M2 (5).
- If readings at M1 (4) and M2 (5) are identical, go to step 9.
- If reading M2 (5) is low or 0 V dc, go to steps 6 and 7, to test alternator positive and negative output circuits.



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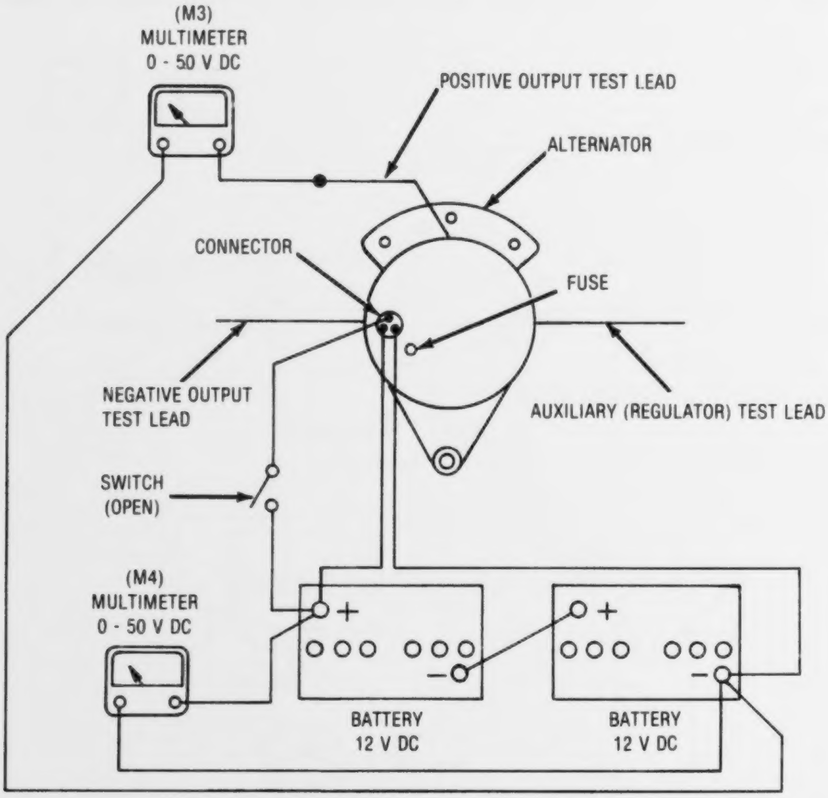
6. TEST ALTERNATOR POSITIVE OUTPUT CIRCUIT.
   - Set up test equipment for positive output circuit test. (See following Positive Output Circuit Test Diagram.)

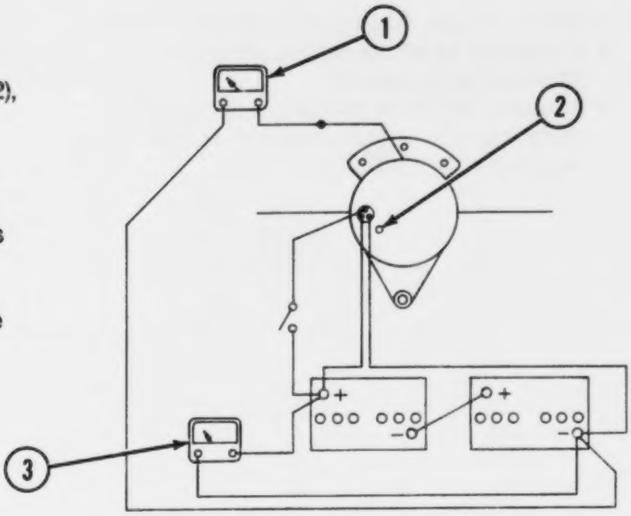

(M3)
MULTIMETER
0 - 50 V DC
POSITIVE OUTPUT TEST LEAD
ALTERNATOR
CONNECTOR
FUSE
NEGATIVE OUTPUT
TEST LEAD
AUXILIARY (REGULATOR) TEST LEAD
SWITCH
(OPEN)
(M4)
MULTIMETER
0 - 50 V DC
+
−
BATTERY
12 V DC
+
−
BATTERY
12 V DC

*Positive Output Circuit Test Diagram*

GO TO NEXT PAGE

## A. ALTERNATOR TEST—Continued

- Check voltage reading at M3 (1).
- If reading at M3 (1) is 0 V dc, check fuse (2), and replace fuse if faulty.
- Recheck voltage reading at M3 (1).
- If reading at M3 (1) is 0 V dc or less than voltage reading at M4 (3), connector plug assembly, isolation diode, or fuse holder is faulty.
- If readings at M3 (1) and M4 (3) are equal, test alternator negative output circuit. (See next step.)



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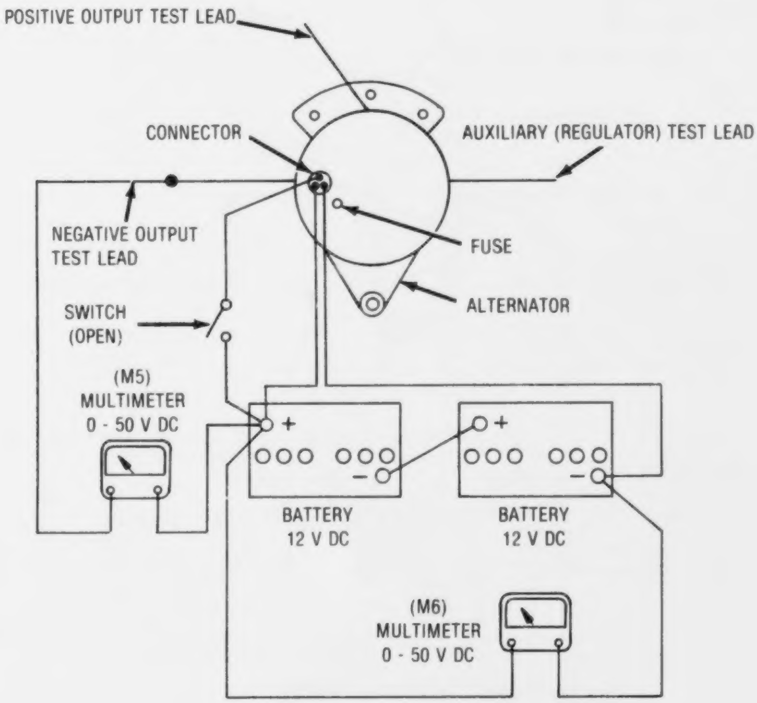
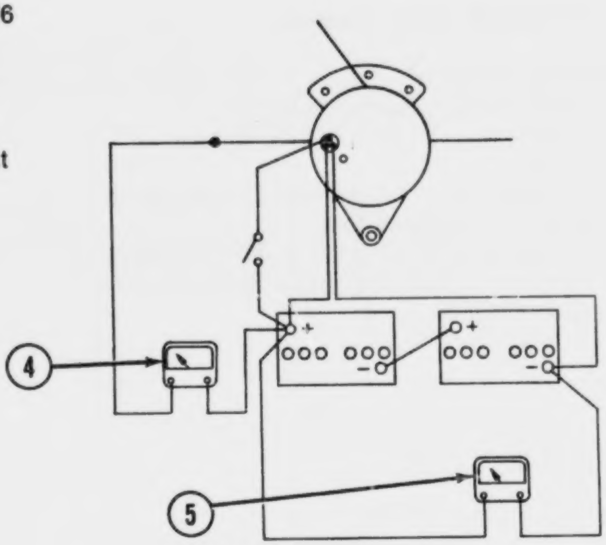
7. TEST ALTERNATOR NEGATIVE OUTPUT CIRCUIT.

- Set up test equipment for negative output circuit test. (See following Negative Output Circuit Test Diagram.)


POSITIVE OUTPUT TEST LEAD
CONNECTOR
AUXILIARY (REGULATOR) TEST LEAD
NEGATIVE OUTPUT TEST LEAD
FUSE
ALTERNATOR
SWITCH (OPEN)
(M5) MULTIMETER 0 - 50 V DC
+
+
−
−
BATTERY 12 V DC
BATTERY 12 V DC
(M6) MULTIMETER 0 - 50 V DC

*Negative Output Circuit Test Diagram*

- Compare voltage readings at M5 (4) and M6 (5).
- If readings at M5 (4) and M6 (5) are not equal, connector plug assembly is faulty.
- If readings at M5 (4) and M6 (5) are equal, test alternator excitation voltage. (See next step.)



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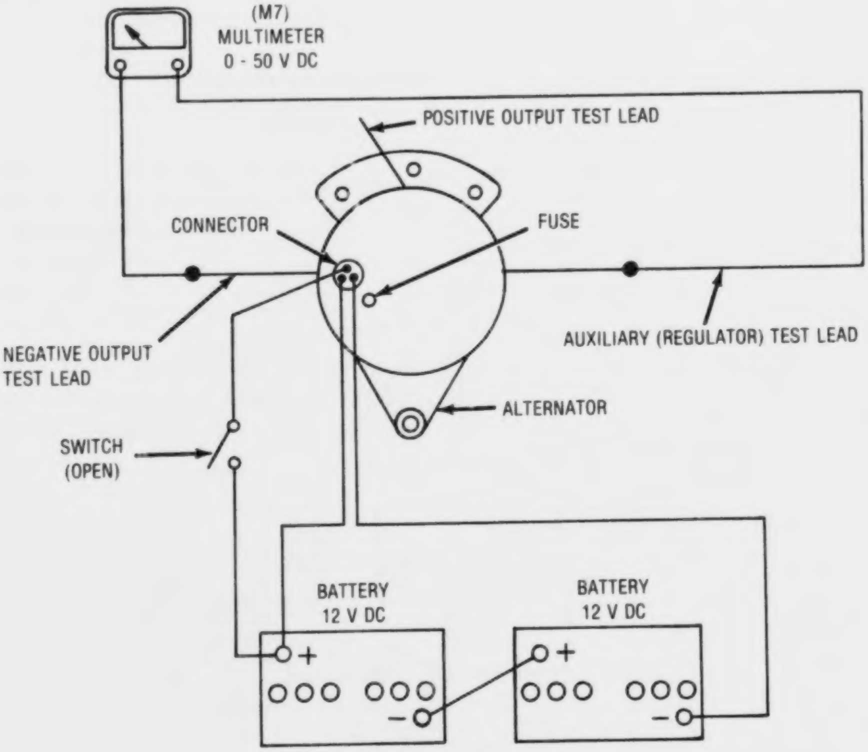
8. TEST ALTERNATOR EXCITATION VOLTAGE.
   - Set up test equipment for alternator excitation voltage test. (See following Excitation Voltage Test Diagram.)

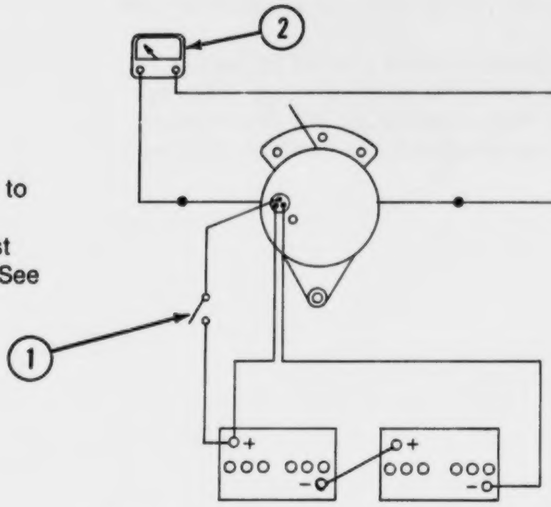

(M7)
MULTIMETER
0 - 50 V DC
POSITIVE OUTPUT TEST LEAD
CONNECTOR
FUSE
NEGATIVE OUTPUT TEST LEAD
AUXILIARY (REGULATOR) TEST LEAD
ALTERNATOR
SWITCH (OPEN)
BATTERY 12 V DC
BATTERY 12 V DC
+
−
+
−

*Excitation Voltage Test Diagram*

GO TO NEXT PAGE

### A. ALTERNATOR TEST—Continued

- Close switch (1).
- Check voltage reading at M7 (2).
- If reading at M7 (2) is 0 V dc, voltage regulator is faulty.
- If reading at M7 (2) exceeds 3.7 V dc, go to step 11 to continue test.
- If reading at M7 (2) is 3.5 ± 0.2 V dc, test alternator output and voltage protector. (See next step.)



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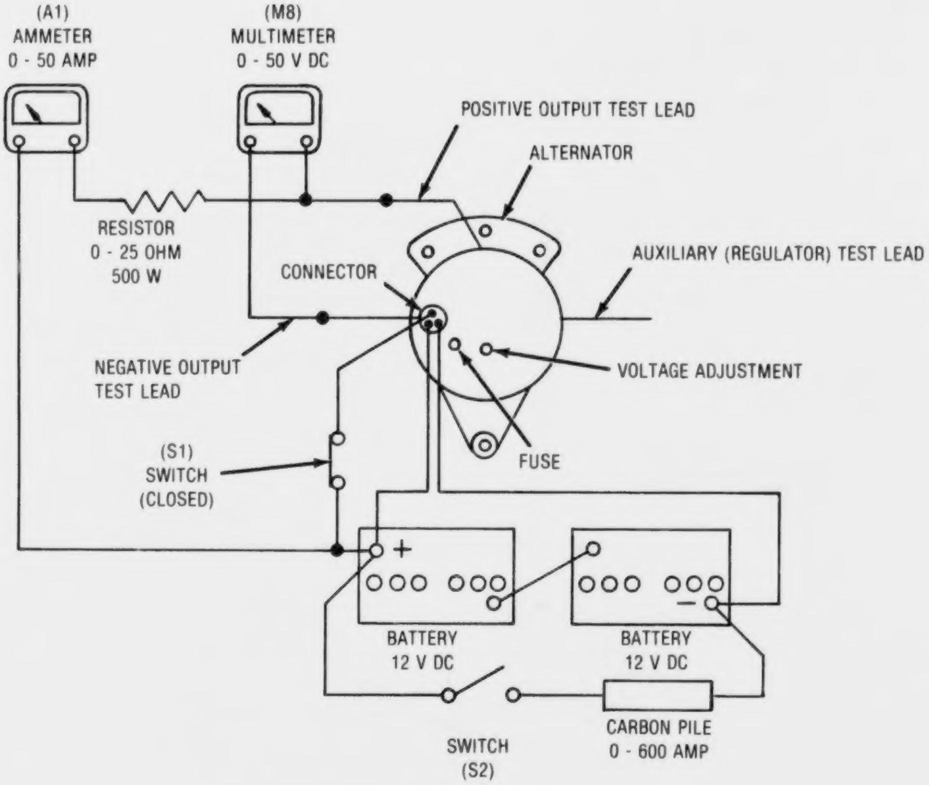
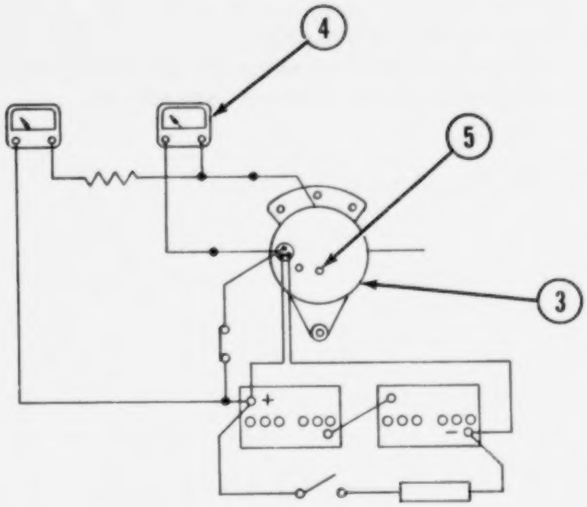
9. TEST ALTERNATOR OUTPUT AND VOLTAGE PROTECTOR.
   - Set up test equipment for alternator output and voltage protector test. (See following Output and Voltage Protector Test Diagram.)


(A1)
AMMETER
0 - 50 AMP
(M8)
MULTIMETER
0 - 50 V DC
POSITIVE OUTPUT TEST LEAD
ALTERNATOR
RESISTOR
0 - 25 OHM
500 W
CONNECTOR
AUXILIARY (REGULATOR) TEST LEAD
NEGATIVE OUTPUT
TEST LEAD
VOLTAGE ADJUSTMENT
(S1)
SWITCH
(CLOSED)
FUSE
+
–
BATTERY
12 V DC
BATTERY
12 V DC
SWITCH
(S2)
CARBON PILE
0 - 600 AMP

*Output and Voltage Protector Test Diagram*

- Remove fuse from fuse holder assembly. (See Alternator, Page 15-47.)
- Drive alternator (3) at 2500 rpm.
- Check voltage reading at M8 (4). M8 should read 28 ± 0.3 V dc.
- If reading at M8 (4) is not correct, adjust voltage adjusting screw (5) until reading at M8 is correct. Use 1/8 inch flat tip screwdriver.
- If reading at M8 (4) is more than 31.2 V dc, voltage protector is faulty.
- If reading at M8 (4) is less than 27.7 V dc, voltage regulator is faulty.



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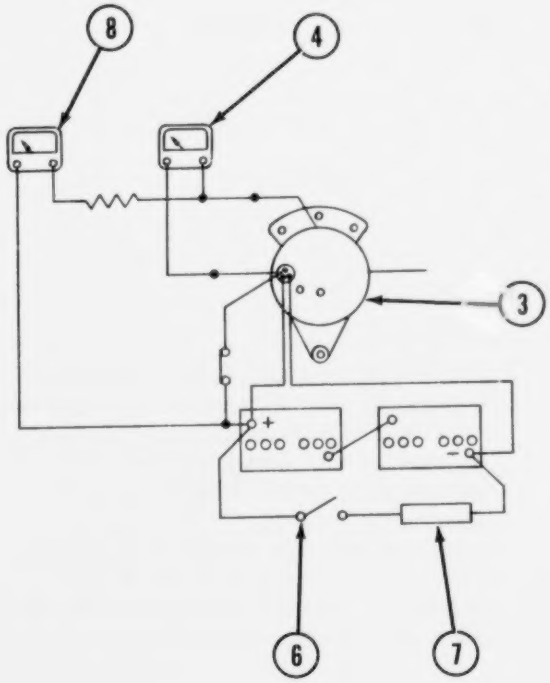


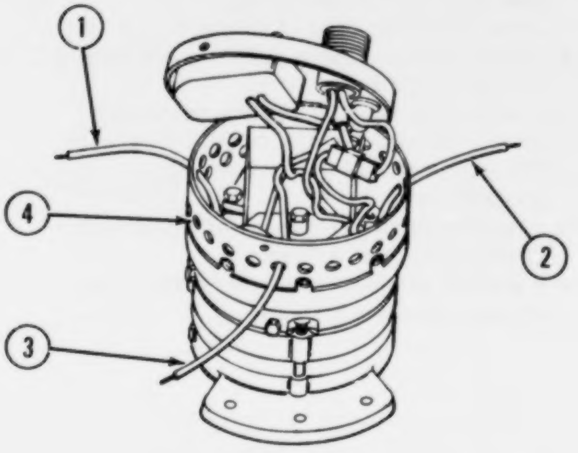
- Close Switch S2 (6).
- Attempt to adjust carbon pile (7) so voltage at M8 (4) is 25 V dc.
- If 25 V dc cannot be obtained, voltage regulator is faulty.
- If 25 V dc can be obtained, check amperage reading at A1 (8). A1 should read 20 — 25 amp.
- If reading at A1 (8) is not correct, disassemble alternator (3), and replace faulty component.
- Open Switch S2 (6).
- Stop alternator (3).
- Remove alternator (3) from test stand.

10. LIFT COVER AND CONNECTOR PLUG ASSEMBLY FROM SHIELD ASSEMBLY. (SEE ALTERNATOR, PAGE 15-31.)

GO TO NEXT PAGE

## A. ALTERNATOR TEST—Continued

11. DISCONNECT TEST LEADS.
    - Push test lead (1), test lead (2), and test lead (3) through holes in shield assembly (4).



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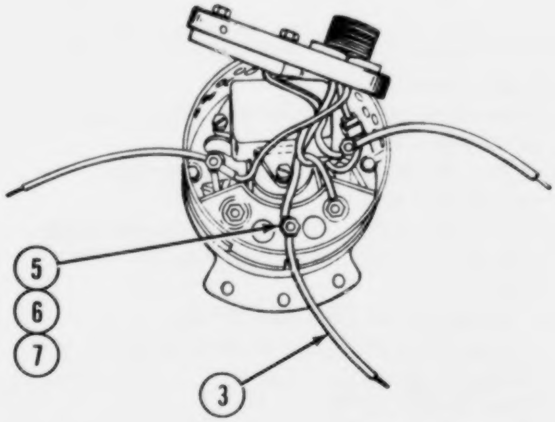
- Remove nut (5), lock washer (6), and test lead (3) from positive output terminal (7). Use 7/16 inch socket with ratchet handle. Discard lock washer.
- Install new lock washer (6) and nut (5) on positive output terminal (7). Use 7/16 inch socket with ratchet handle.



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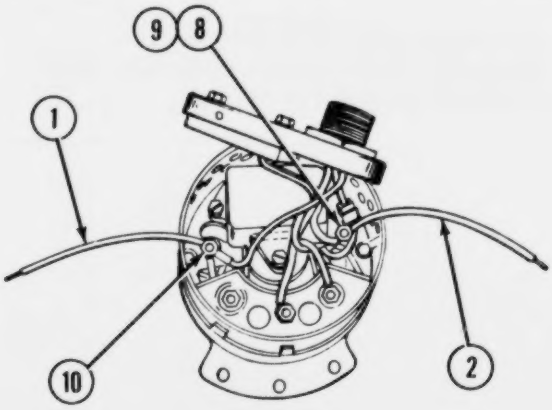
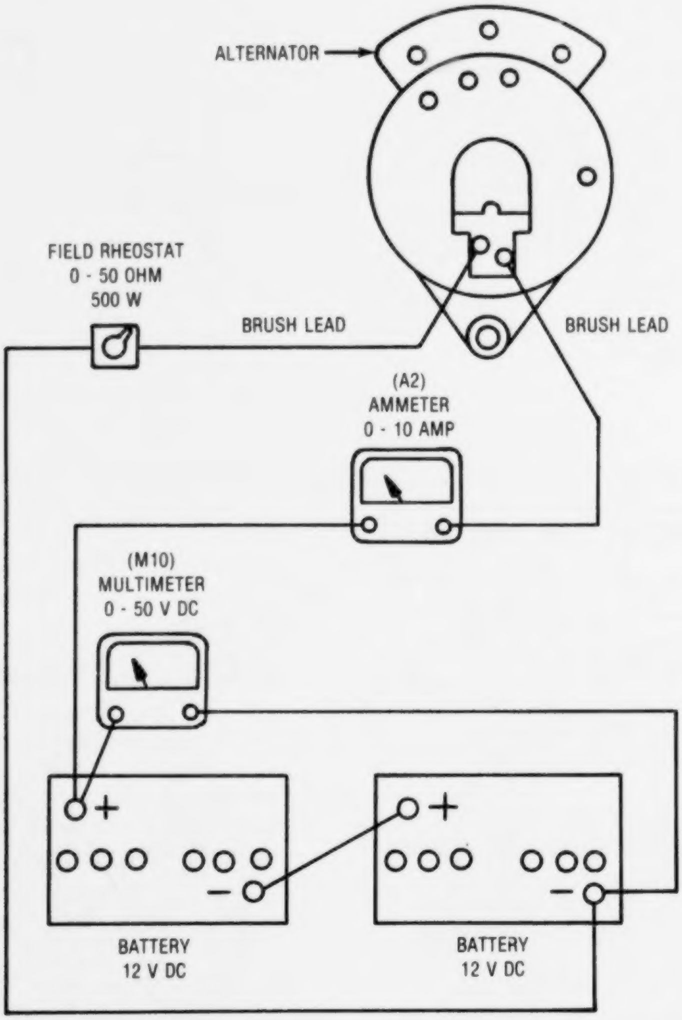
- Remove two nuts with captive washers (8), test lead (2), and test lead (1) from negative output terminal (9) and auxiliary terminal (10). Use 3/8 inch socket with 5 inch extension and ratchet handle. Discard nuts with captive washers.
- Install two new nuts with captive washers (8) on negative output terminal (9) and auxiliary terminal (10). Use 3/8 inch socket with 5 inch extension and ratchet handle.



12. TEST ALTERNATOR FIELD CURRENT.
    - Remove shield and isolation diode assemblies from alternator. (See Alternator, Page 15-52).
    - Remove voltage regulator assembly from alternator. (See Alternator, Page 15-55.)
    - Set up test equipment for alternator field current test. (See following Alternator Field Current Test Diagram.)

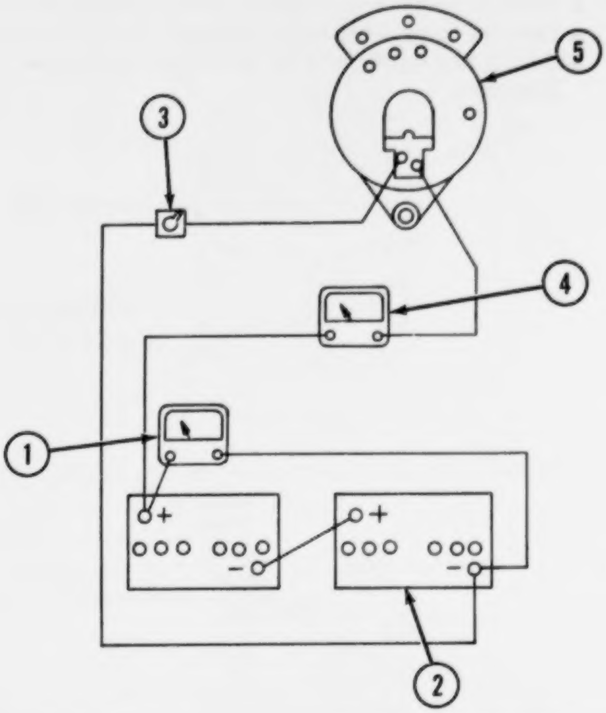

ALTERNATOR
FIELD RHEOSTAT
0 - 50 OHM
500 W
BRUSH LEAD
BRUSH LEAD
(A2)
AMMETER
0 - 10 AMP
(M10)
MULTIMETER
0 - 50 V DC
+
+
−
−
BATTERY
12 V DC
BATTERY
12 V DC

*Alternator Field Current Test Diagram*

GO TO NEXT PAGE

### A. ALTERNATOR TEST—Continued

- Check voltage reading at M10 (1). M10 should read 24 V dc.
- If reading at M10 (1) is not correct, charge two batteries (2).
- Set rheostat (3) to maximum resistance.
- Slowly reduce rheostat (3) to minimum resistance.
- Check amperage reading at A2 (4). A2 should read 1.25 — 1.75 amp.
- If reading at A2 (4) is not correct, disassemble alternator (5), and replace faulty component.
- Disassemble test equipment.
- Install voltage regulator assembly on alternator. (See Alternator, Page 15-57.)
- Install shield and isolation diode assemblies on alternator. (See Alternator, Page 15-55.)
- Lower and secure cover and connector plug assembly on shield assembly. (See Alternator, Page 15-34.)



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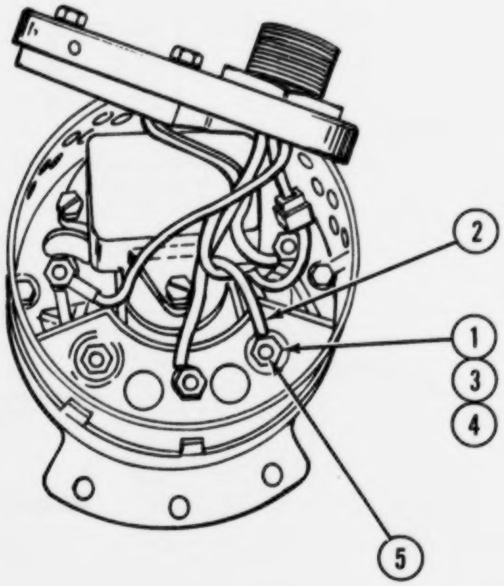
### B. COVER AND CONNECTOR PLUG ASSEMBLY REMOVAL

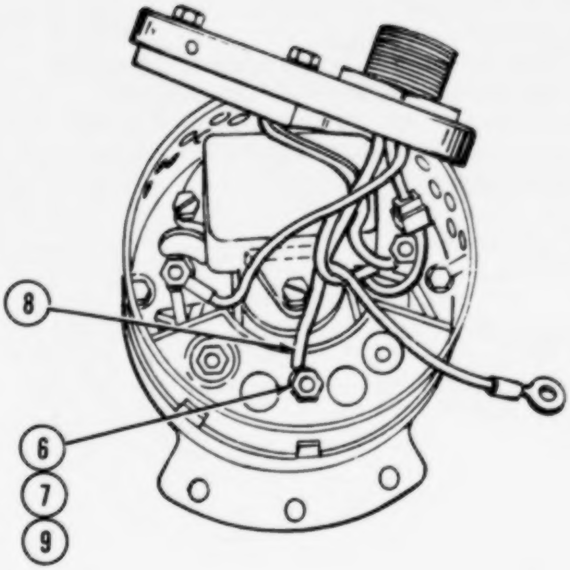
**CAUTION**

Electrical leads can be easily damaged. Lift cover and connector plug assembly carefully to prevent damage to leads.

1. LIFT COVER AND CONNECTOR PLUG ASSEMBLY FROM SHIELD ASSEMBLY. (SEE ALTERNATOR, PAGE 15-31.)
2. REMOVE RECEPTACLE LEAD FROM DIODE PLATE STUD.
   - Tag and mark lead.
   - Remove nut with captive washer (1), lead (2), insulating washer (3), and sleeve (4) from diode plate stud (5). Use 3/8 inch socket with 5 inch extension and ratchet handle. Discard nut with captive washer.



3. REMOVE FUSE HOLDER LEAD FROM POSITIVE OUTPUT TERMINAL.
   - Tag and mark lead.
   - Remove nut (6), lock washer (7), and lead (8) from positive output terminal (9). Use 7/16 inch socket with ratchet handle. Discard lock washer.



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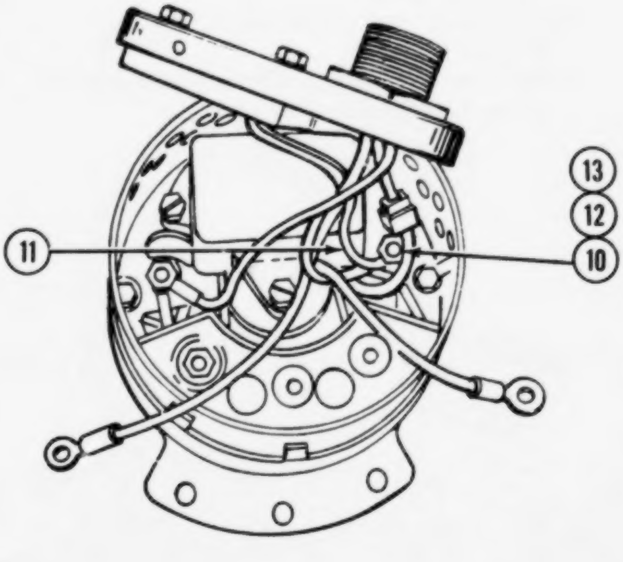
**NOTE**

Do not remove regulator lead from negative output terminal.

4. REMOVE BLACK VOLTAGE PROTECTOR LEAD FROM NEGATIVE OUTPUT TERMINAL.
   - Tag and mark lead.
   - Remove nut with captive washer (10), lead (11), and insulating washer (12) from negative output terminal (13). Use 3/8 inch socket with 5 inch extension and ratchet handle. Discard nut with captive washer.



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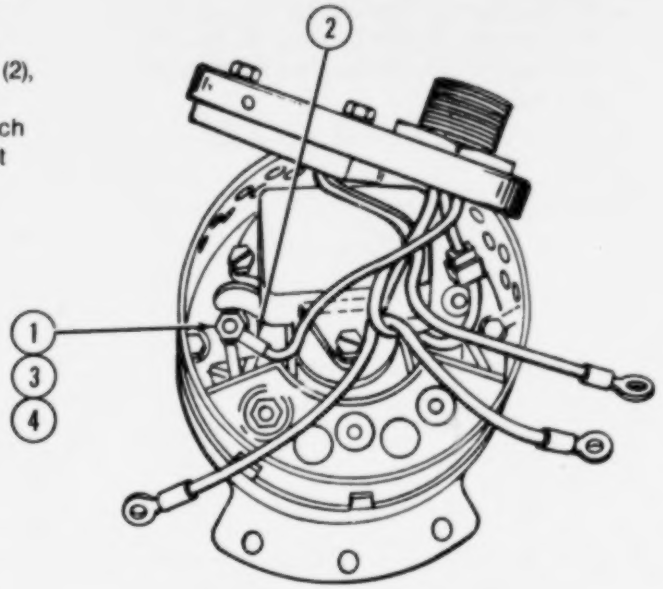
### B. COVER AND CONNECTOR PLUG ASSEMBLY REMOVAL — Continued

5. REMOVE RED VOLTAGE PROTECTOR LEAD FROM AUXILIARY TERMINAL.
   - Tag and mark lead.
   - Remove nut with captive washer (1), lead (2), and insulating washer (3) from auxiliary terminal (4). Use 3/8 inch socket with 5 inch extension and ratchet handle. Discard nut with captive washer.



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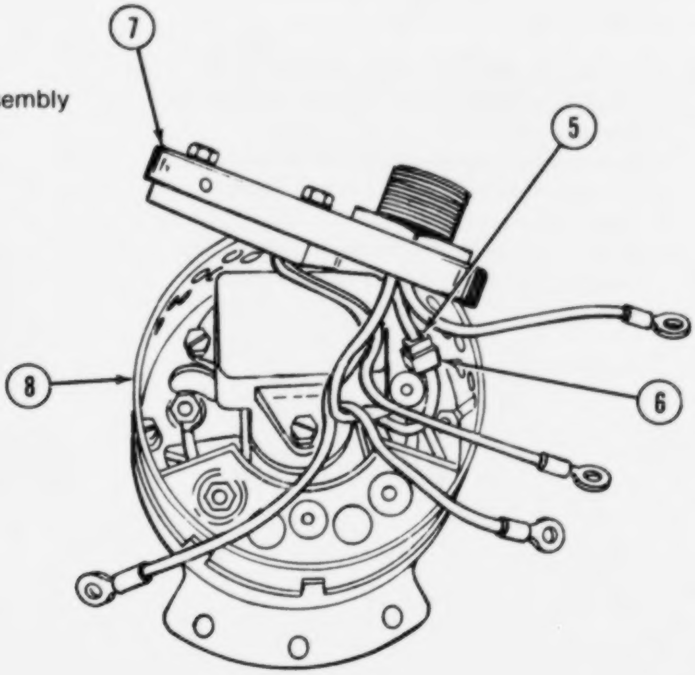
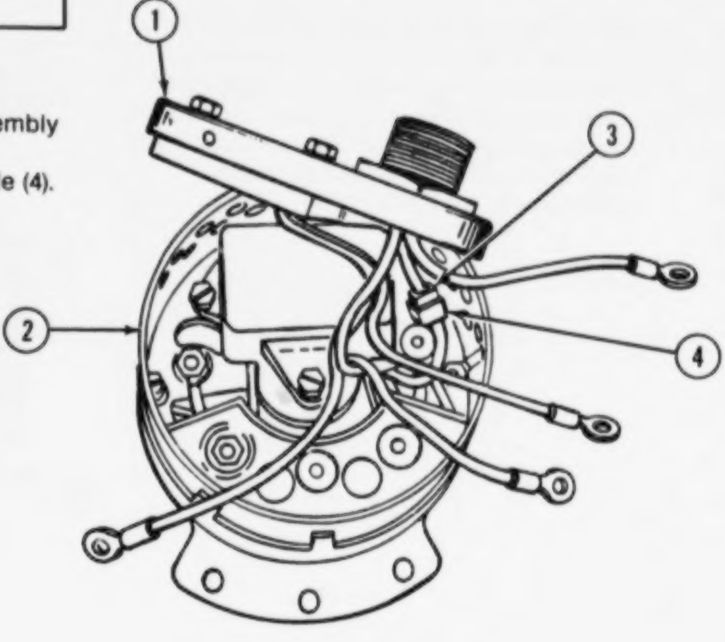
6. DISCONNECT LEAD CONNECTOR FROM RECEPTACLE.
   - Tag and mark led.
   - Disconnect lead connector (5) from receptacle (6).
   - Remove cover and connector plug assembly (7) from shield assembly (8).



## C. COVER AND CONNECTOR PLUG ASSEMBLY INSTALLATION

1. CONNECT LEAD CONNECTOR TO RECEPTACLE.
   - Position cover and connector plug assembly (1) on shield assembly (2).
   - Connect lead connector (3) to receptacle (4).
   - Remove tag from lead.



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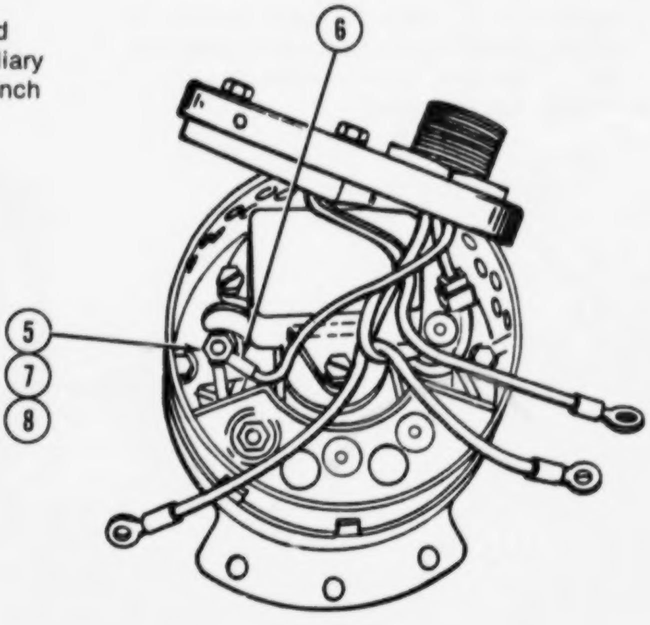
2. INSTALL RED VOLTAGE PROTECTOR LEAD ON AUXILIARY TERMINAL.
   - Install insulating washer (5), lead (6), and new nut with captive washer (7) on auxiliary terminal (8). Use 3/8 inch socket with 5 inch extension and ratchet handle.
   - Remove tag from lead.



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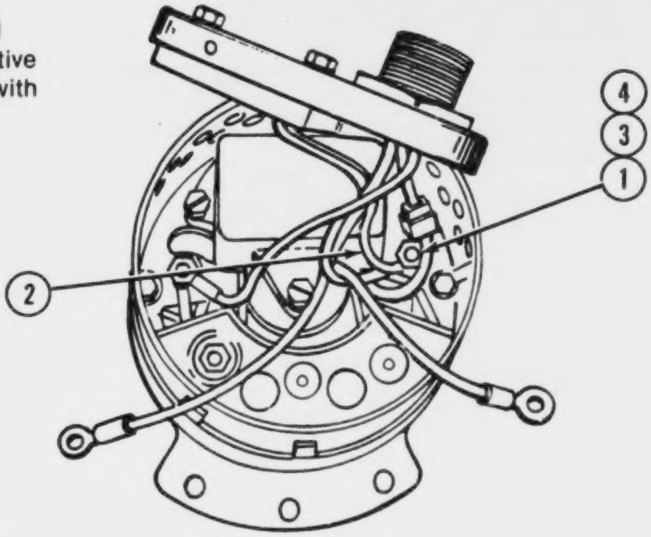
## C. COVER AND CONNECTOR PLUG ASSEMBLY INSTALLATION — Continued

3. INSTALL BLACK VOLTAGE PROTECTOR LEAD ON NEGATIVE OUTPUT TERMINAL.
    - Install insulating washer (1), lead (2), and new nut with captive washer (3) on negative output terminal (4). Use 3/8 inch socket with 5 inch extension and ratchet handle.
    - Remove tag from lead.



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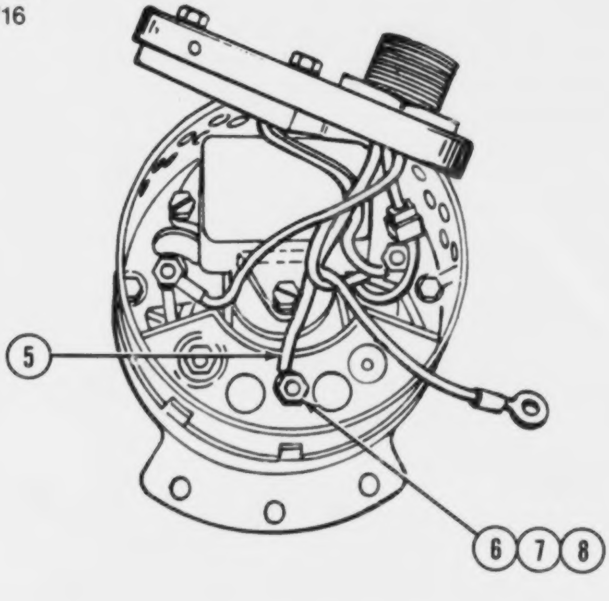
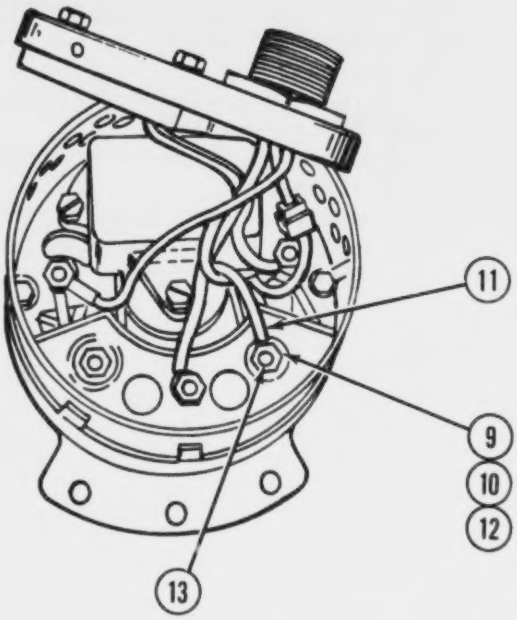
4. INSTALL FUSE HOLDER LEAD ON POSITIVE OUTPUT TERMINAL.
    - Install lead (5), new lock washer (6), and nut (7) on positive output terminal (8). Use 7/16 inch socket with ratchet handle.
    - Remove tag from lead.



5. INSTALL RECEPTACLE LEAD ON DIODE PLATE STUD.
   - Install insulating sleeve (9), washer (10), lead (11), and new nut with captive washer (12) on diode plate stud (13). Use 3/8 inch socket with 5 inch extension and ratchet handle.
   - Remove tag from lead.

6. LOWER AND SECURE COVER AND CONNECTOR PLUG ASSEMBLY ON SHIELD ASSEMBLY. (SEE ALTERNATOR, PAGE 15-34.)



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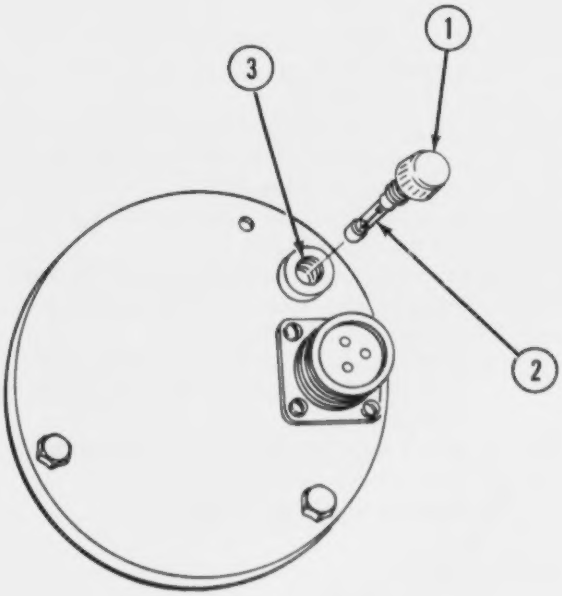
## D. FUSE HOLDER ASSEMBLY REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)

2. REMOVE FUSE FROM FUSE HOLDER ASSEMBLY.
   - Turn cap (1) to left, and remove cap with fuse (2) from fuse holder (3).
   - Remove fuse (2) from cap (1).



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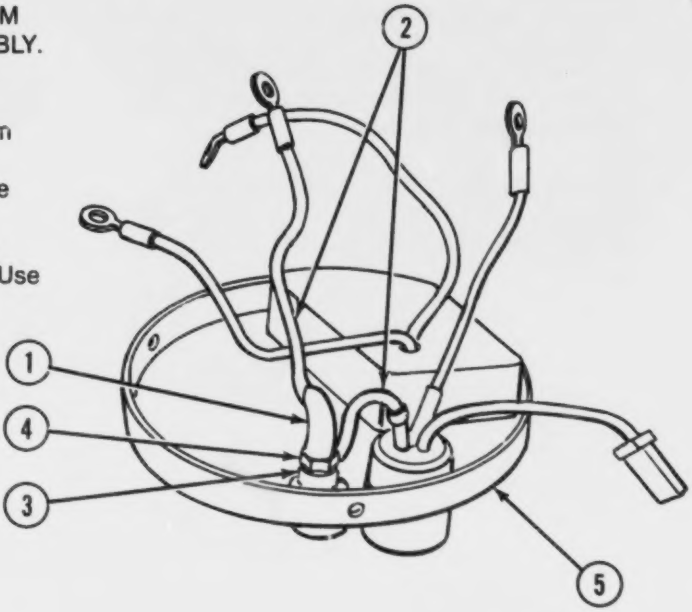
## D. FUSE HOLDER ASSEMBLY REMOVAL — Continued

3. REMOVE FUSE HOLDER ASSEMBLY FROM COVER AND CONNECTOR PLUG ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Tag and mark leads.
   - Cut and remove heat shrink tube (1) from leads (2). Use pocket knife.
   - Unsolder leads (2) at fuse holder (3). (See TM 55-1500-323-25.)
   - Remove nut (4) and fuse holder (3) from cover and connector plug assembly (5). Use 11/16 inch open end wrench.



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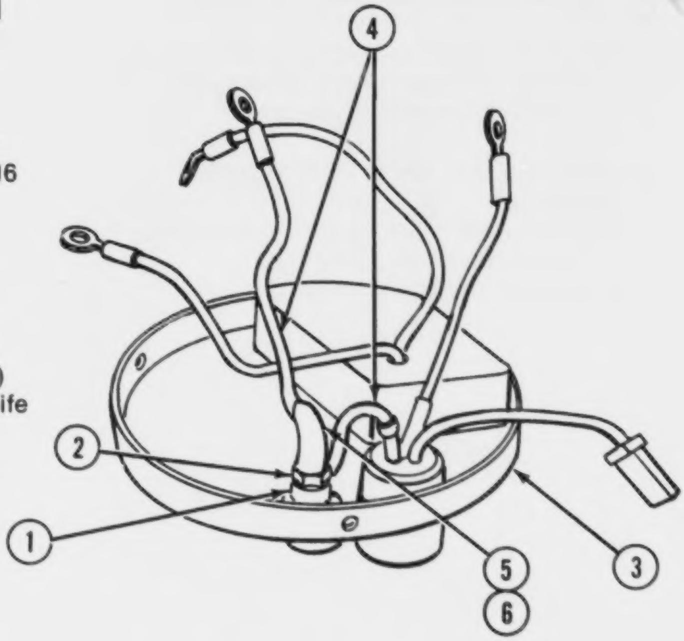
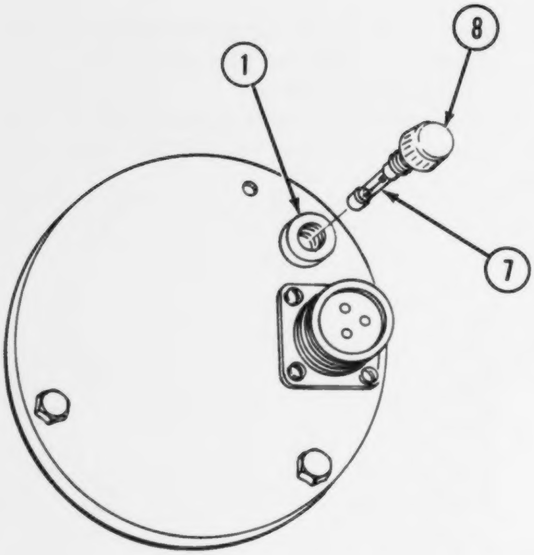
## E. FUSE HOLDER ASSEMBLY INSTALLATION

1. INSTALL FUSE HOLDER ON COVER AND CONNECTOR PLUG ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Install fuse holder (1) and nut (2) on cover and connector plug assembly (3). Use 11/16 inch open end wrench.
   - Solder leads (4) at fuse holder (1). (See TM 55-1500-323-25.)
   - Position new heat shrink tubing (5) over leads (4) until heat shrink tubing is over solder connection (6).
   - Cut heat shrink tubing (5) 1 1/2 in. (3.8 cm) from solder connection (6). Use pocket knife and steel rule.
   - Install heat shrink tubing (5) on leads (4). (See TM 55-1500-323-25.)
   - Remove tags from leads.



2. INSTALL FUSE IN FUSE HOLDER.
   - Install fuse (7) in cap (8).
   - Install cap (8) with fuse (7) in fuse holder (1).
3. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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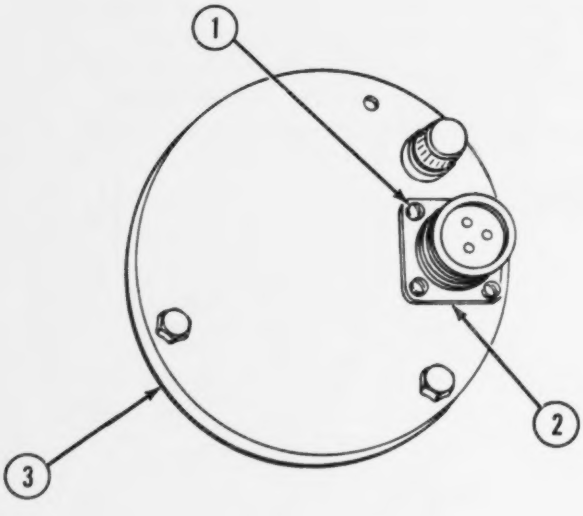
## F. CONNECTOR PLUG ASSEMBLY REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)
2. REMOVE CONNECTOR PLUG ASSEMBLY FROM COVER.
   - Remove four screws (1) and connector plug assembly (2) from cover (3). Use 1/4 inch flat tip screwdriver.



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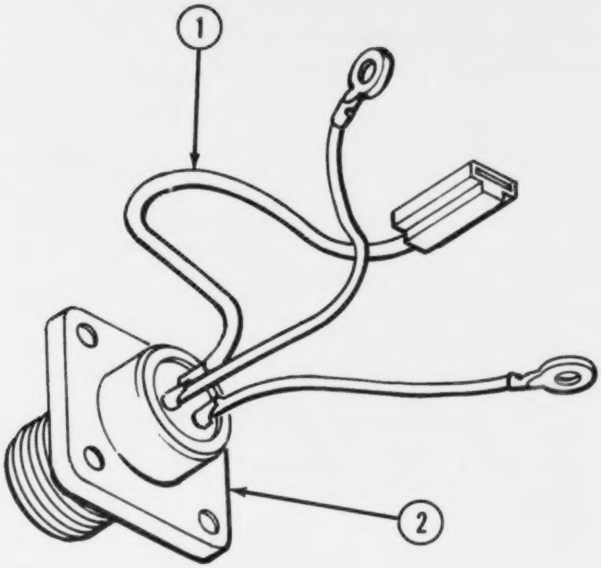
## F. CONNECTOR PLUG ASSEMBLY REMOVAL — Continued

3. UNSOLDER LEADS AT CONNECTOR PLUG ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Tag and mark leads.
   - Unsolder three leads (1) at connector plug assembly (2). (See TM 55-1500-323-25.)



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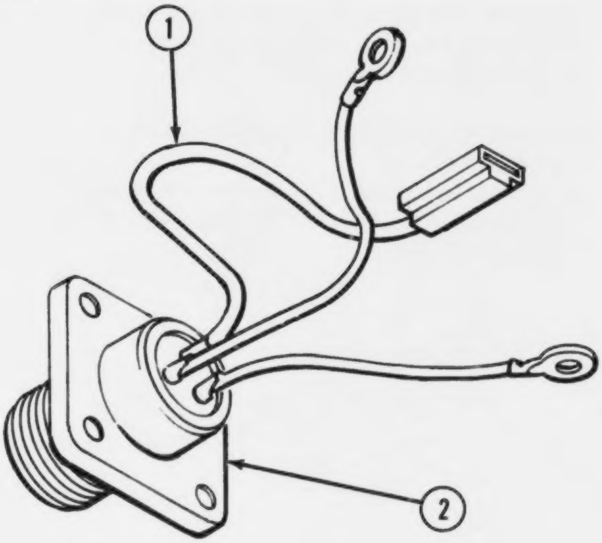
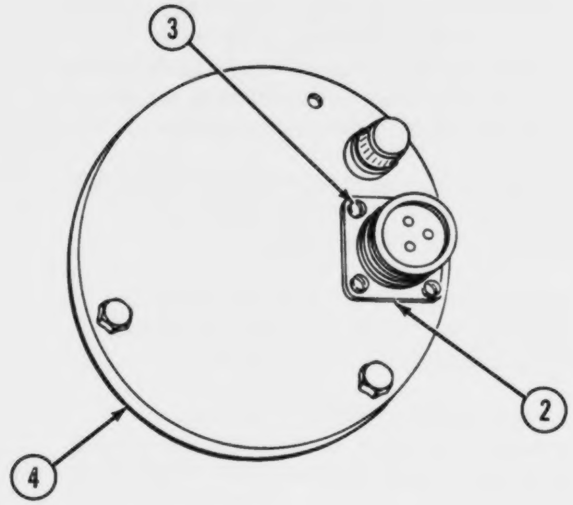
## G. CONNECTOR PLUG ASSEMBLY INSTALLATION

1. SOLDER LEADS AT CONNECTOR PLUG ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Solder three leads (1) at connector plug assembly (2). (See TM 55-1500-323-25.)
   - Remove tags from lead.



2. INSTALL CONNECTOR PLUG ASSEMBLY ON COVER.
   - Install connector plug assembly (2) and four screws (3) on cover (4). Use 1/4 inch flat tip screwdriver.
3. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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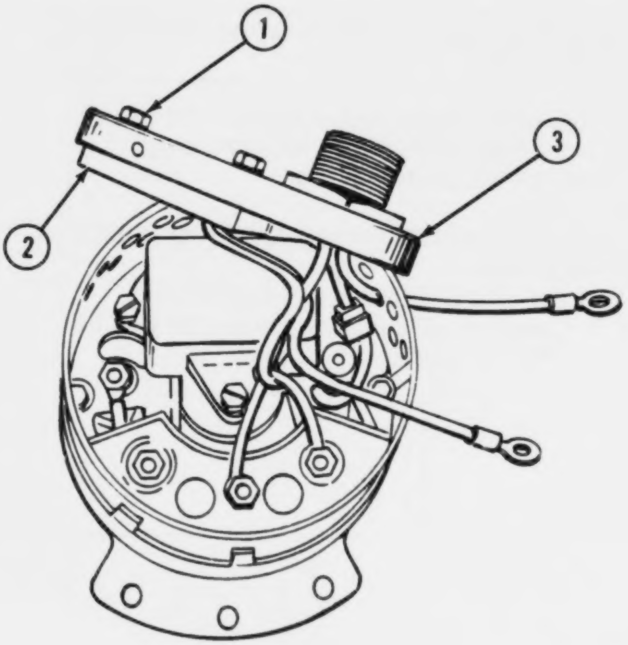
## I. VOLTAGE PROTECTOR REMOVAL

1. LIFT COVER AND CONNECTOR PLUG ASSEMBLY FROM SHIELD ASSEMBLY. (SEE ALTERNATOR, PAGE 15-31.)
2. REMOVE BLACK VOLTAGE PROTECTOR LEAD FROM NEGATIVE OUTPUT TERMINAL. (SEE ALTERNATOR, PAGE 15-43.)
3. REMOVE RED VOLTAGE PROTECTOR LEAD FROM AUXILIARY TERMINAL. (SEE ALTERNATOR, PAGE 15-44.)
4. REMOVE VOLTAGE PROTECTOR FROM COVER AND CONNECTOR PLUG ASSEMBLY.
   - Remove two screws (1) and voltage protector (2) from cover and connector plug assembly (3). Use 1/4 inch flat tip screwdriver.



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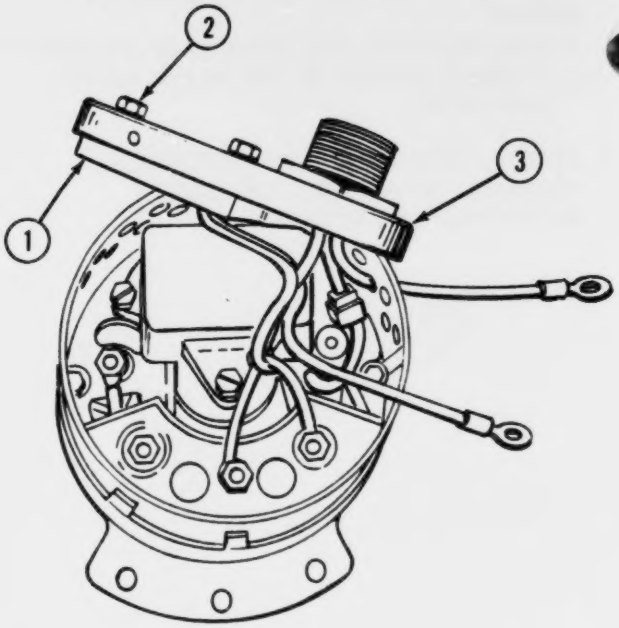
## 15-8 ALTERNATOR — Continued

### I. VOLTAGE PROTECTOR INSTALLATION

1. INSTALL VOLTAGE PROTECTOR ON COVER AND CONNECTOR PLUG ASSEMBLY.
   - Install voltage protector (1) and two screws (2) on cover and connector plug assembly (3). Use 1/4 inch flat tip screwdriver.
2. INSTALL RED VOLTAGE PROTECTOR LEAD ON AUXILIARY TERMINAL. (SEE ALTERNATOR, PAGE 15-45.)
3. INSTALL BLACK VOLTAGE PROTECTOR LEAD ON NEGATIVE OUTPUT TERMINAL. (SEE ALTERNATOR, PAGE 15-46.)
4. LOWER AND SECURE COVER AND CONNECTOR PLUG ASSEMBLY ON SHIELD ASSEMBLY. (SEE ALTERNATOR, PAGE 15-34.)



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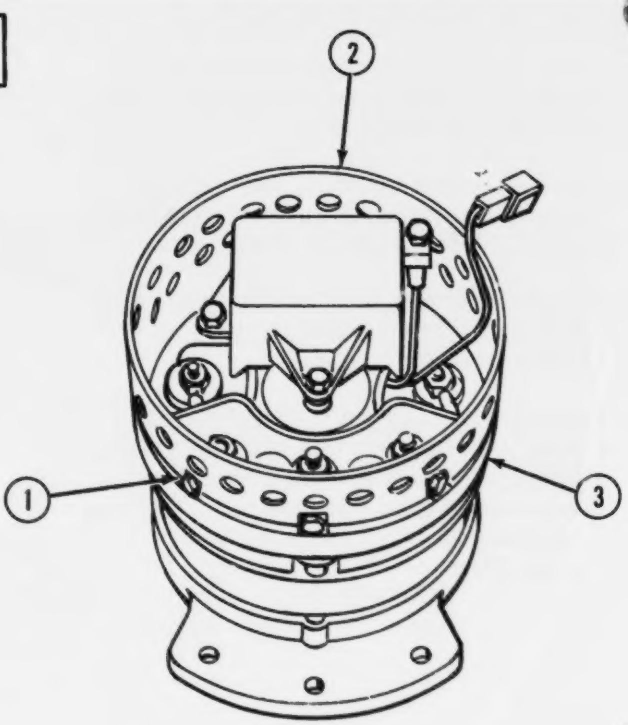
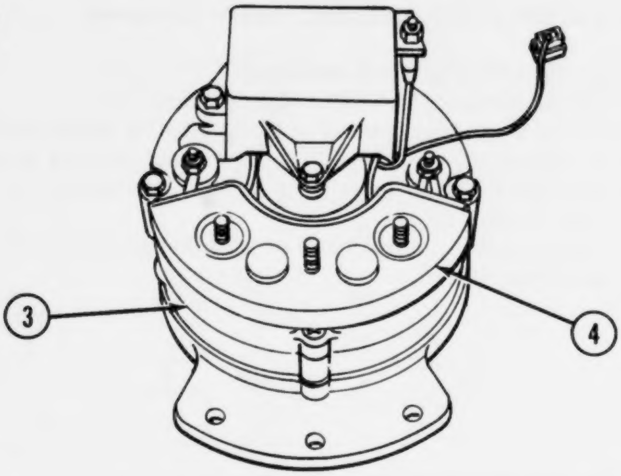
### J. SHIELD AND ISOLATION DIODE ASSEMBLIES REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)
2. REMOVE SHIELD ASSEMBLY FROM REAR HOUSING.
   - Remove eight screws (1) and shield assembly (2) from rear housing (3). Use 1/4 inch handled socket wrench.



3. REMOVE ISOLATION DIODE ASSEMBLY (4) FROM REAR HOUSING (3).



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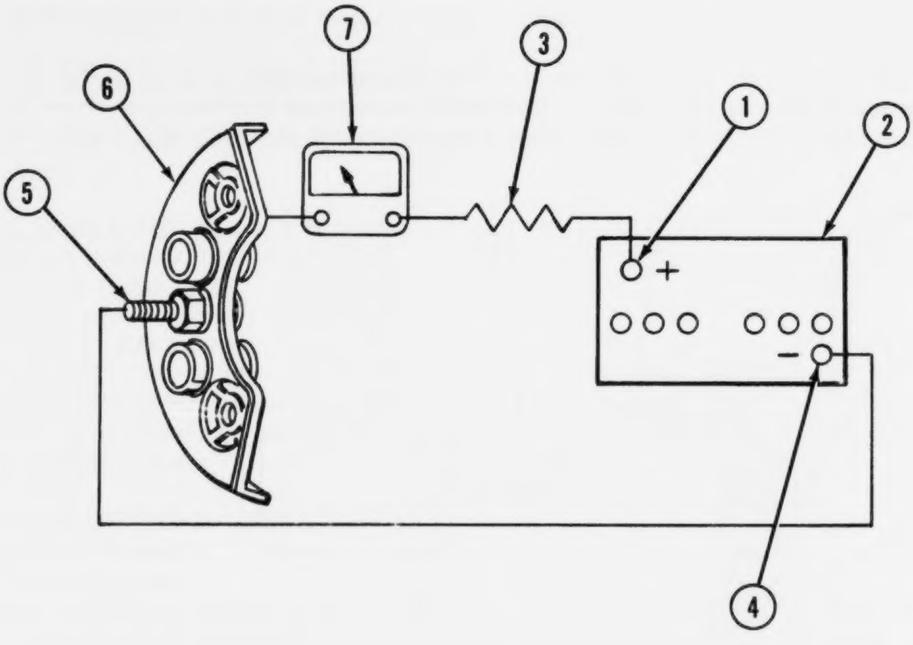
## K. ISOLATION DIODE ASSEMBLY TEST

1. SET UP TEST EQUIPMENT FOR ISOLATION DIODE ASSEMBLY TEST.
   - Connect (+) terminal (1) of 12 V dc battery (2) to 50k ohm resistor (3).
   - Connect (−) terminal (4) of 12 V dc battery (2) to positive output stud (5) on isolation diode assembly (6).
   - Connect multimeter (7) between 50k ohm resistor (3) and bare metal on isolation diode assembly (6).



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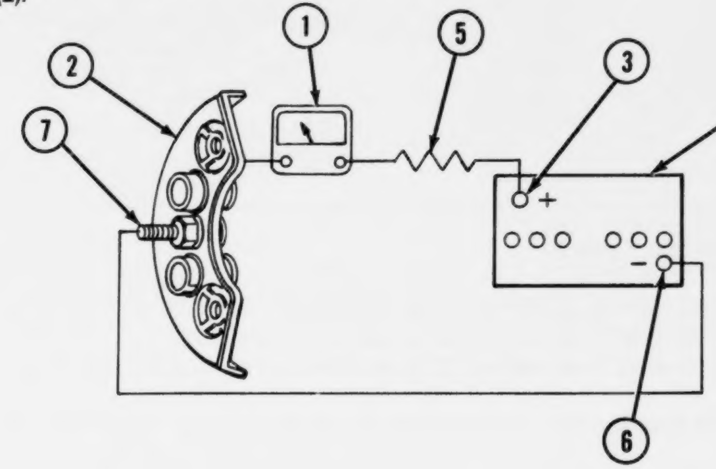
## K. ISOLATION DIODE ASSEMBLY TEST—Continued

2. TEST ISOLATION DIODE ASSEMBLY.
   - Set multimeter (1) to 500 milliamp scale.
   - Check amperage reading at multimeter (1). Multimeter should read less than 100 milliamp.
   - If reading at multimeter (1) is not correct, replace isolation diode assembly (2).
   - If reading at multimeter (1) is correct, disconnect ( + ) terminal (3) of 12 V dc battery (4) from 50k ohm resistor (5).
   - Disconnect ( − ) terminal (6) of 12 V dc battery (4) from positive output stud (7) on isolation diode assembly (2).



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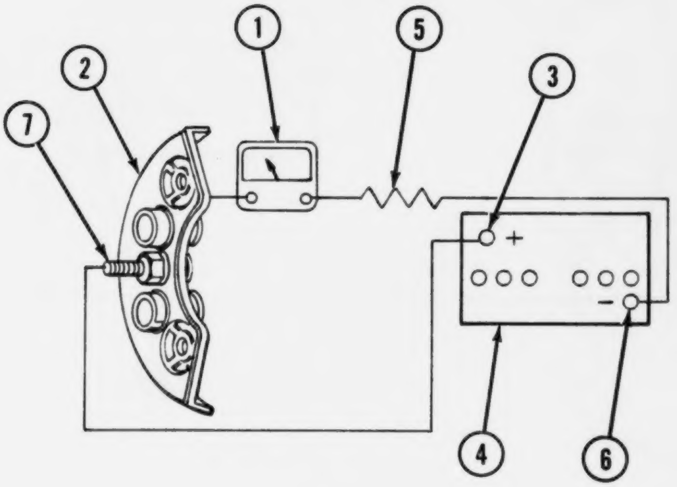
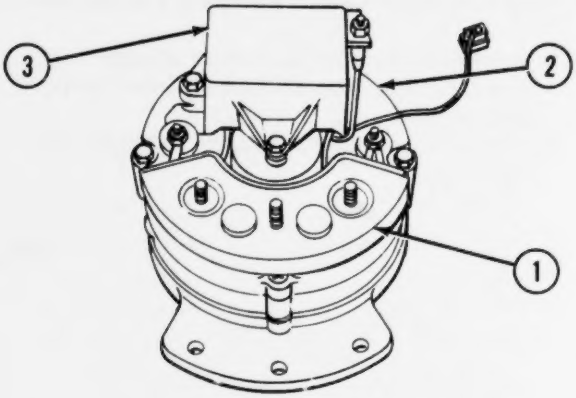
- Connect ( + ) terminal (3) of 12 V dc battery (4) to positive output stud (7) on isolation diode assembly (2).
- Connect ( − ) terminal (6) of 12 V dc battery (4) to 50k ohm resistor (5).
- Check amperage reading at multimeter (1). Multimeter should read 0 milliamp.
- If reading at multimeter (1) is not correct, replace isolation diode assembly (2).



## L. SHIELD AND ISOLATION DIODE ASSEMBLIES INSTALLATION

1. POSITION ISOLATION DIODE ASSEMBLY (1) ON REAR HOUSING (2) AND OPPOSITE VOLTAGE REGULATOR ASSEMBLY (3).



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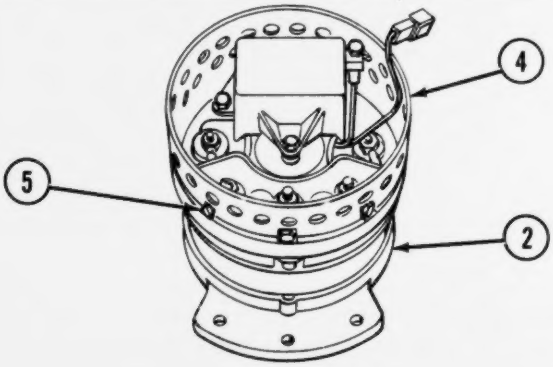
2. INSTALL SHIELD ASSEMBLY ON REAR HOUSING.
   - Install shield assembly (4) and eight screws (5) on rear housing (2). Use 1/4 inch handled socket wrench.
3. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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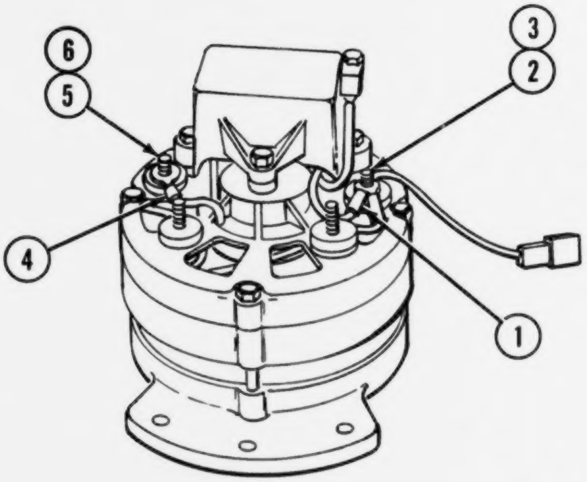
## M. VOLTAGE REGULATOR ASSEMBLY REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)
2. REMOVE SHIELD AND ISOLATION DIODE ASSEMBLIES FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-52.)

**CAUTION**

Voltage leads can be easily damaged. Lift voltage regulator assembly carefully to prevent damage to leads.

3. REMOVE VOLTAGE REGULATOR ASSEMBLY FROM REAR HOUSING.
   - Tag and mark leads.
   - Remove lead (1) and insulating washer (2) from negative output terminal (3).
   - Remove lead (4) and insulating washer (5) from auxiliary terminal (6).



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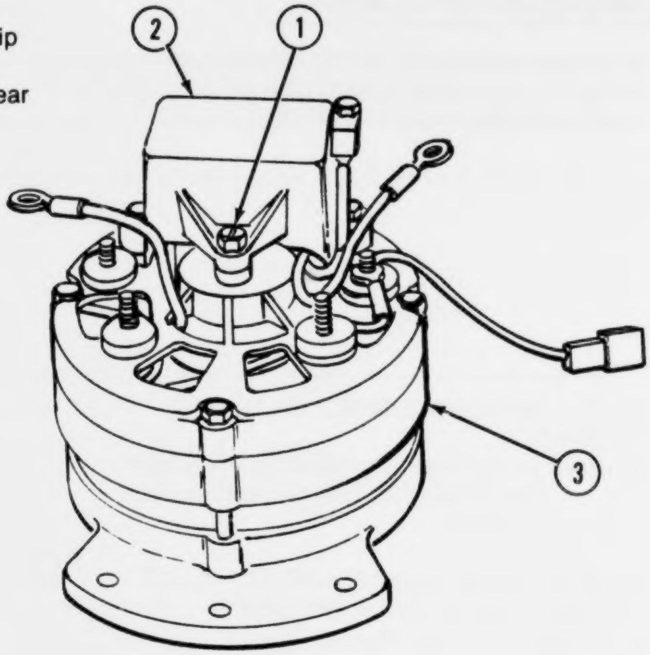
## M. VOLTAGE REGULATOR ASSEMBLY REMOVAL — Continued

- Remove three screws (1) from voltage regulator assembly (2). Use 3/8 inch flat tip screwdriver.
- Lift voltage regulator assembly (2) from rear housing (3).



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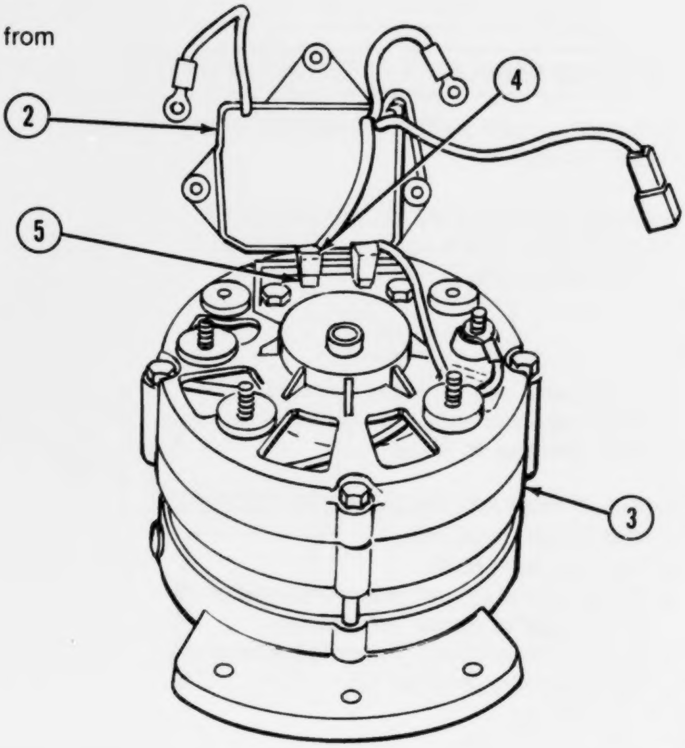
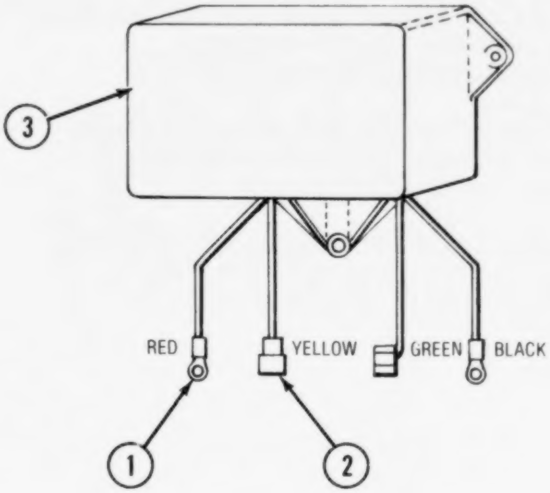
- Disconnect negative lead connector (4) from brush terminal (5).
- Remove voltage regulator assembly (2) from rear housing (3).



## N. VOLTAGE REGULATOR ASSEMBLY TEST

TEST VOLTAGE REGULATOR.

- Connect (+) probe of multimeter to voltage regulator red lead (1).
- Connect (–) probe of multimeter to voltage regulator yellow lead (2).
- Check resistance reading at multimeter. Multimeter should read infinite resistance.
- If reading at multimeter is not correct, replace voltage regulator (3).
- Connect (+) probe of multimeter to voltage regulator yellow lead (2).
- Connect (–) probe of multimeter to voltage regulator red lead (1).
- Check resistance reading at multimeter. Multimeter should read 300 — 350 ohm.
- If reading at multimeter is not correct, replace voltage regulator (3).



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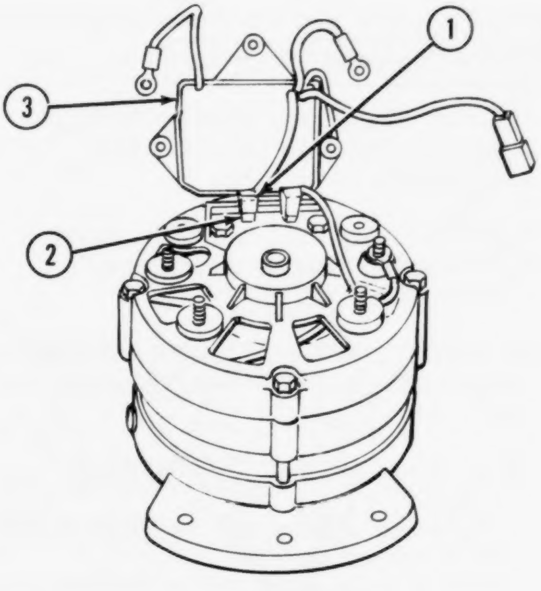
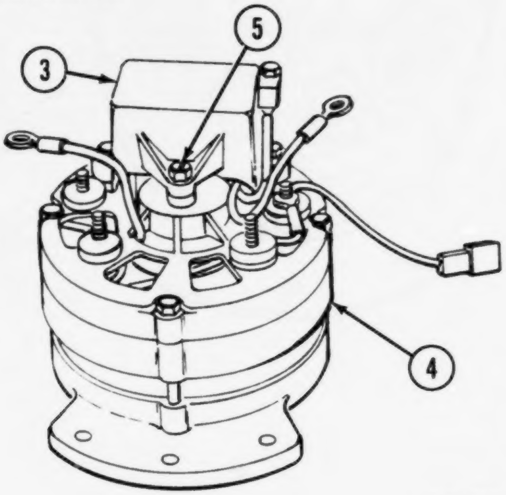
## O. VOLTAGE REGULATOR ASSEMBLY INSTALLATION

1. INSTALL VOLTAGE REGULATOR ASSEMBLY ON REAR HOUSING.
   - Connect negative lead connector (1) to brush terminal (2).
   - Position voltage regulator assembly (3) on rear housing (4) with mounting holes alined.
   - Install three screws (5) on voltage regulator assembly (3). Use 3/8 inch flat tip screwdriver.





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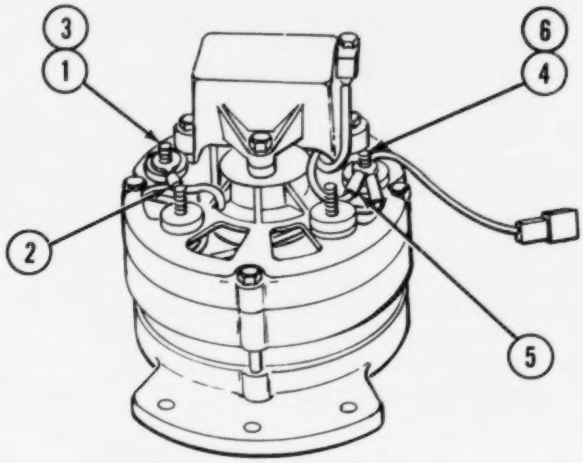
## O. VOLTAGE REGULATOR ASSEMBLY INSTALLATION — Continued

- Install insulating washer (1) and lead (2) on auxiliary terminal (3).
- Install insulating washer (4) and lead (5) on negative output terminal (6).
- Remove tags from leads.

2. INSTALL SHIELD AND ISOLATION DIODE ASSEMBLIES ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)

3. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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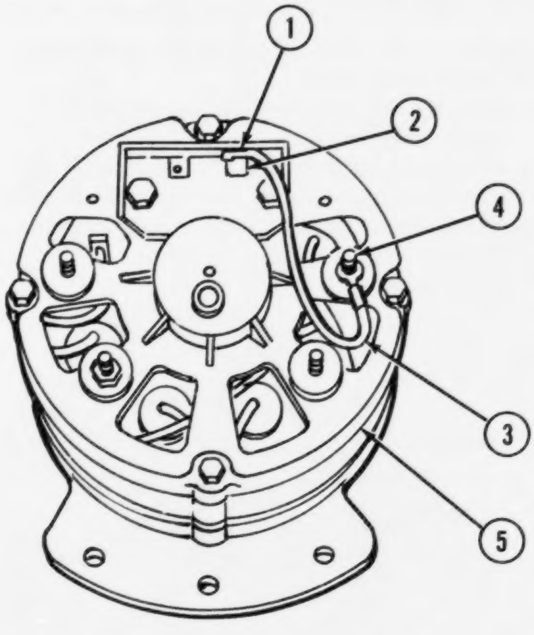
## P. BRUSH ASSEMBLY REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)

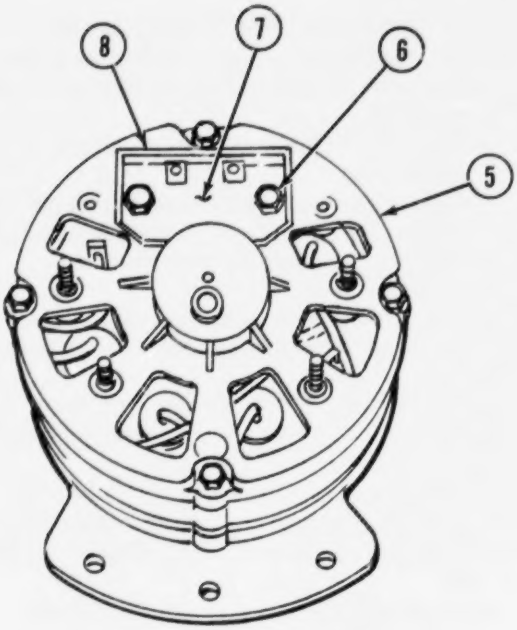
2. REMOVE SHIELD AND ISOLATION DIODE ASSEMBLIES FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-52.)

3. REMOVE VOLTAGE REGULATOR ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)

4. REMOVE NEGATIVE LEAD FROM REAR HOUSING.
   - Disconnect negative lead connector (1) from brush terminal (2).
   - Remove negative lead (3) from negative output terminal (4) and rear housing (5).



5. REMOVE BRUSH ASSEMBLY FROM REAR HOUSING.
   - Remove two self-tapping screws (6) and brush cover (7) from brush assembly (8). Use 1/4 inch handled socket wrench. Discard self-tapping screws.
   - Remove brush assembly (8) from rear housing (5).



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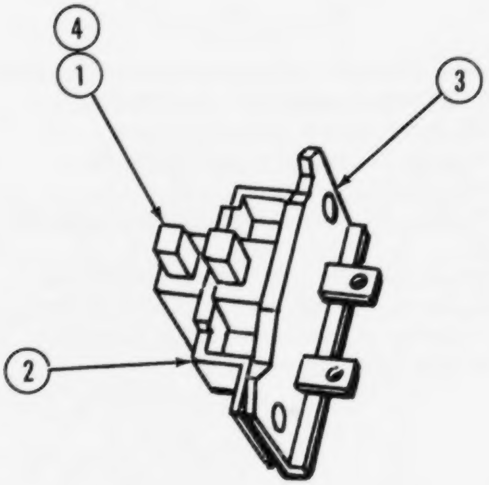
## Q. BRUSH ASSEMBLY INSPECTION AND TEST

1. INSPECT BRUSH ASSEMBLY.
   - Measure distance two brushes (1) extend below bottom of brush holder (2). Use steel rule. Brushes should extend at least 3/16 in. (4.8 mm) below bottom of brush holder.
   - If measured distance is not correct, replace brush assembly (3).
   - Test tension of brush spring (4). Use brush spring tester. Tension should be at least 4 oz (113.4 g).
   - If tension is not correct, replace brush assembly (3).



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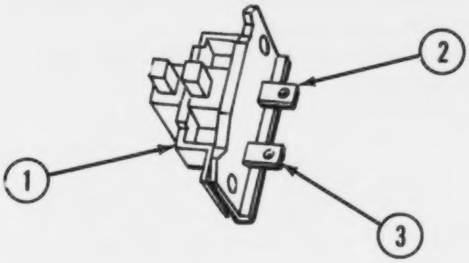
## Q. BRUSH ASSEMBLY INSPECTION AND TEST—Continued

2. TEST BRUSH ASSEMBLY INSULATION.
   - Set multimeter to 0.05 — 0.15 ohm scale.
   - Position (+) probe of multimeter on brush holder (1).
   - Position (−) probe of multimeter on terminal (2).
   - Check resistance reading at multimeter. Multimeter should read infinite resistance.
   - Position (−) probe of multimeter on terminal (3).
   - Check resistance reading at multimeter. Multimeter should read infinite resistance.



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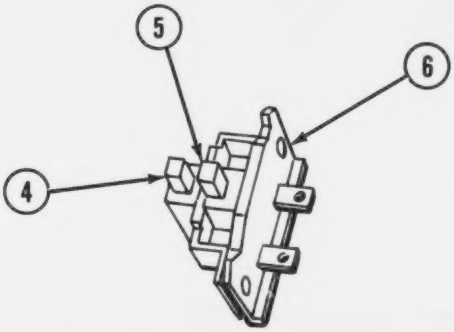
- Position (−) probe of multimeter on brush (4).
- Check resistance reading at multimeter. Multimeter should read infinite resistance.
- Position (−) probe of multimeter on brush (5).
- Check resistance reading at multimeter. Multimeter should read infinite resistance.
- If any of the above readings for insulation test is not correct, replace brush assembly (6).



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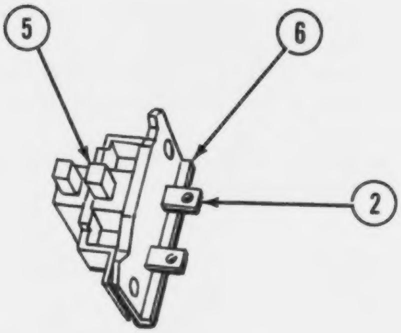
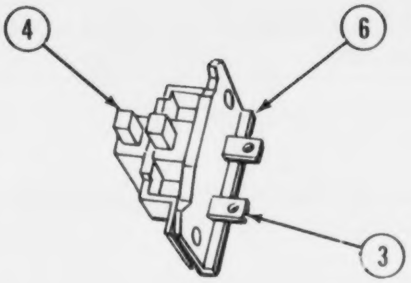
3. TEST BRUSH ASSEMBLY CONTINUITY.
   - Set multimeter to RX1 ohm scale.
   - Position (+) probe of multimeter on terminal (2).
   - Position (−) probe of multimeter on brush (5).
   - Check resistance reading at multimeter. Multimeter should read 0.15 ohm or less.
   - If reading at multimeter is not correct, replace brush assembly (6).



- Position (+) probe of multimeter on terminal (3).
- Position (−) probe of multimeter on brush (4).
- Check resistance reading at multimeter. Multimeter should read 0.15 ohm or less.
- If reading at multimeter is not correct, replace brush assembly (6).



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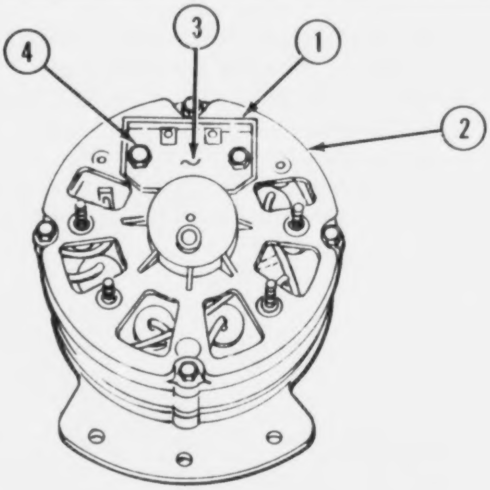
## R. BRUSH ASSEMBLY INSTALLATION

1. INSTALL BRUSH ASSEMBLY ON REAR HOUSING.
   - Position brush assembly (1) on rear housing (2) with mounting holes alined.
   - Install brush cover (3) and two new self-tapping screws (4) on brush assembly (1). Use 1/4 inch handled socket wrench.



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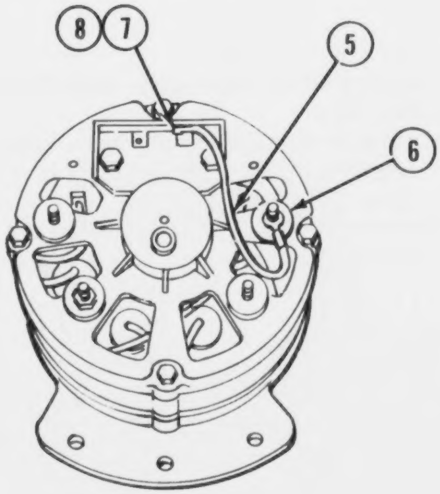
2. INSTALL NEGATIVE LEAD ON REAR HOUSING.
   - Install negative lead (5) on negative output terminal (6).
   - Connect negative lead connector (7) to brush terminal (8).
3. INSTALL VOLTAGE REGULATOR ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-57.)
4. INSTALL SHIELD AND ISOLATION DIODE ASSEMBLIES ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
5. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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## 15-8 ALTERNATOR — Continued

### S. STATOR ASSEMBLY AND REAR HOUSING REMOVAL

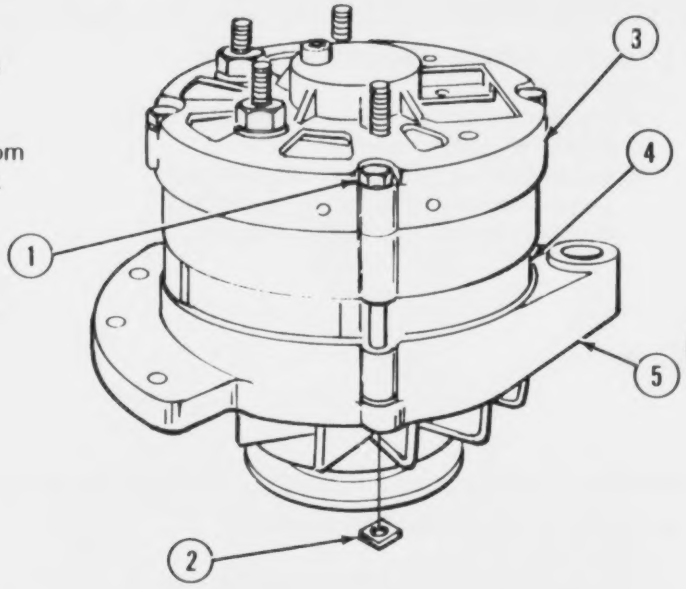
1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)

2. REMOVE SHIELD AND ISOLATION DIODE ASSEMBLIES FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-52.)

3. REMOVE VOLTAGE REGULATOR ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)

4. REMOVE BRUSH ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-58.)

5. REMOVE REAR HOUSING AND STATOR ASSEMBLY FROM FRONT HOUSING.
   - Remove four screws (1) and nuts (2) from rear housing (3). Use 1/4 inch handled socket wrench.
   - Remove rear housing (3) and stator (4) from front housing (5). Use soft faced nammer.



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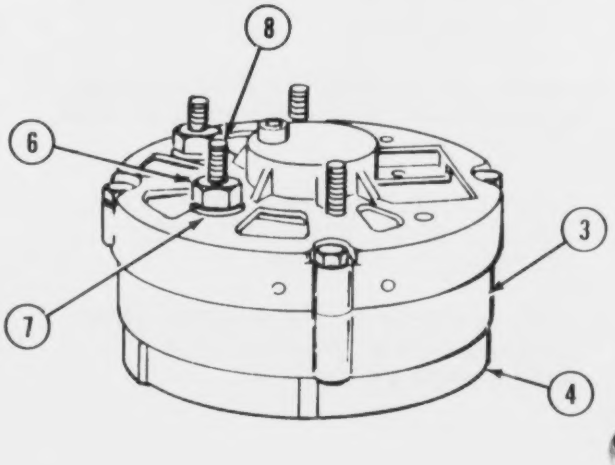
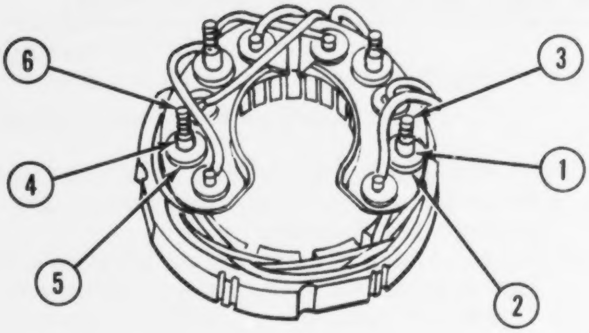
6. REMOVE REAR HOUSING FROM STATOR ASSEMBLY.
   - Remove two nuts (6) and four insulating washers (7) from two studs (8). Use 3/8 inch open end wrench.
   - Remove rear housing (3) from stator (4). Use soft faced hammer.



## T. STATOR ASSEMBLY DISASSEMBLY

1. REMOVE TWO INSULATING SLEEVES AND WASHERS FROM TWO DIODE ASSEMBLY TERMINALS.
   - Remove two insulating sleeves (1) and washers (2) from two negative diode studs (3).
   - Remove two insulating sleeves (4) and washers (5) from two positive diode studs (6).



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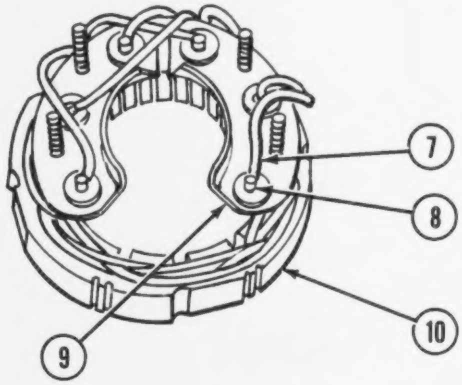
2. REMOVE NEGATIVE DIODE ASSEMBLY FROM STATOR ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Tag and mark leads.
   - Unsolder three leads (7) at three negative diode terminals (8). (See TM 55-1500-323-25.)
   - Remove negative diode assembly (9) from stator (10).



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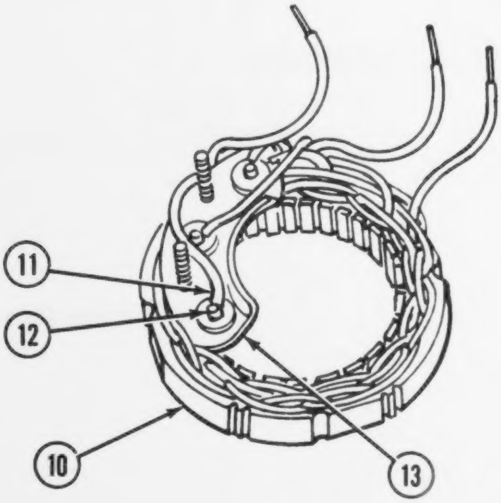
3. REMOVE POSITIVE DIODE ASSEMBLY FROM STATOR ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Tag and mark leads.
   - Unsolder three leads (11) at three positive diode terminals (12). (See TM 55-1500-323-25.)
   - Remove positive diode assembly (13) from stator (10).



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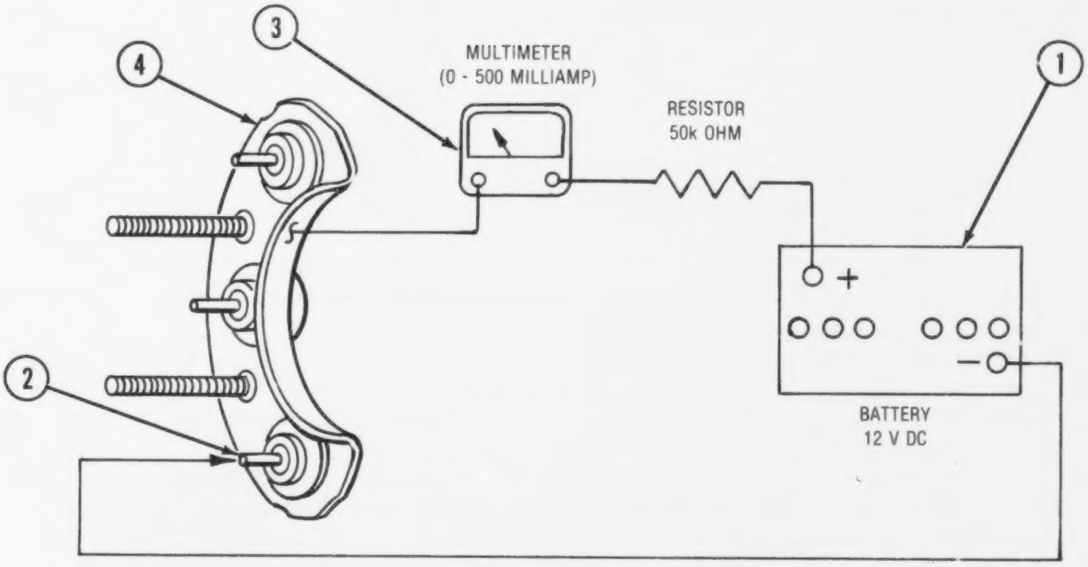
## 15-8 ALTERNATOR — Continued

### U. DIODE AND STATOR ASSEMBLIES TESTS

**NOTE**

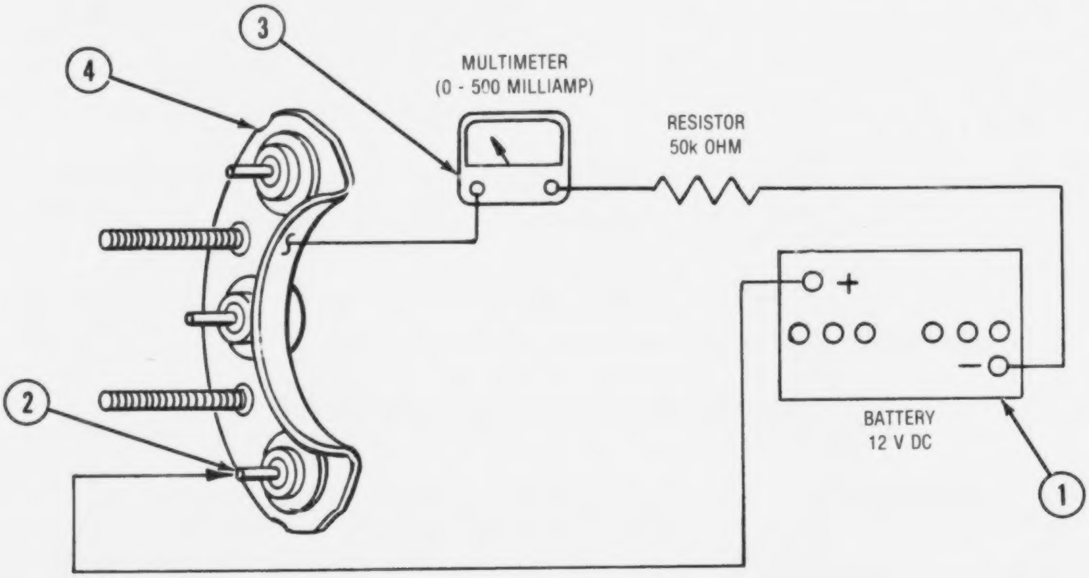
Positive diode assembly has diodes with red printed part numbers.

1. TEST POSITIVE DIODE ASSEMBLY FOR NO CURRENT FLOW.
   - Set up test equipment for no current flow test. (See following No Current Flow Positive Diode Assembly Test Diagram.)
   - Place ( – ) probe of battery (1) against three individual diode terminals (2), and check amperage reading at multimeter (3) each time. Multimeter should read 0 milliamp.
   - If multimeter reading is not correct for any of three diode terminals (2), positive diode assembly (4) is faulty.
   - If multimeter reading is correct, test positive diode assembly (4) for full current flow. (See next step.)



*No Current Flow Positive Diode Assembly Test Diagram*

2. TEST POSITIVE DIODE ASSEMBLY FOR FULL CURRENT FLOW.
   - Set up test equipment for full current flow test. (See following Full Current Flow Positive Diode Assembly Test Diagram.)
   - Place (+) probe of battery (1) against three individual diode terminals (2), and check amperage readings at multimeter (3) each time. Multimeter should read at least 100 milliamp.
   - If multimeter reading is not correct for any of three diode terminals (2), positive diode assembly (4) is faulty.



3
4
MULTIMETER
(0 - 500 MILLIAMP)
RESISTOR
50k OHM
+
−
BATTERY
12 V DC
2
1

*Full Current Flow Positive Diode Assembly Test Diagram*

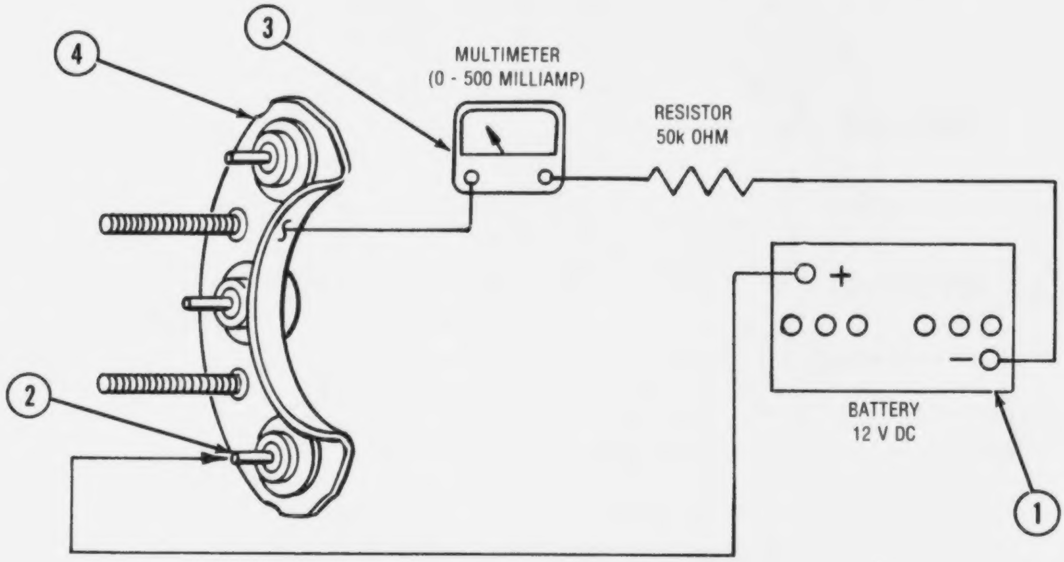
GO TO NEXT PAGE

## U. DIODE AND STATOR ASSEMBLIES TESTS — Continued

**NOTE**

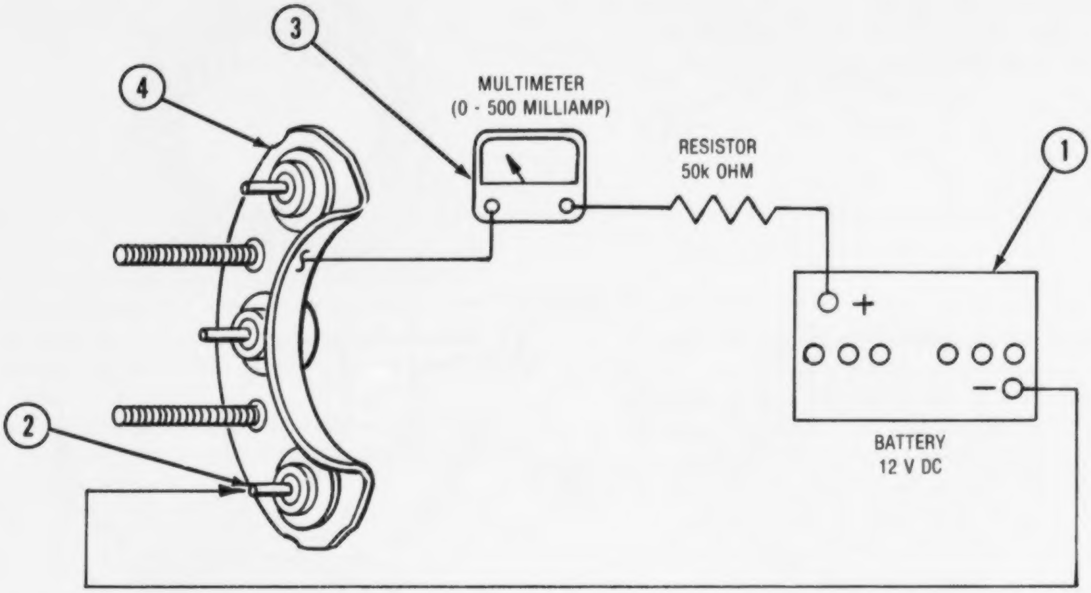
Negative diode assembly has diodes with black printed part numbers.

3. TEST NEGATIVE DIODE ASSEMBLY FOR NO CURRENT FLOW.
   - Set up test equipment for no current flow. (See following No Current Flow Negative Diode Assembly Test Diagram.)
   - Place (+) probe of battery (1) against three individual diode terminals (2), and check amperage reading at multimeter (3) each time. Multimeter should read 0 milliamp.
   - If multimeter reading is not correct for any of three diode terminals (2), negative diode assembly (4) is faulty.
   - If multimeter reading is correct, test negative diode assembly (4) for full current flow. (See next step.)



*No Current Flow Negative Diode Assembly Test Diagram*

4. TEST NEGATIVE DIODE ASSEMBLY FOR FULL CURRENT FLOW.
   - Set up test equipment for full current flow test. (See following Full Current Flow Negative Diode Assembly Test Diagram).
   - Place ( – ) probe of battery (1) against three individual diode terminals (2), and check amperage reading at multimeter (3) each time. Multimeter should read at least 100 milliamp.
   - If multimeter reading is not correct for any of three diode terminals (2), negative diode assembly (4) is faulty.



*Full Current Flow Negative Diode Assembly Test Diagram*

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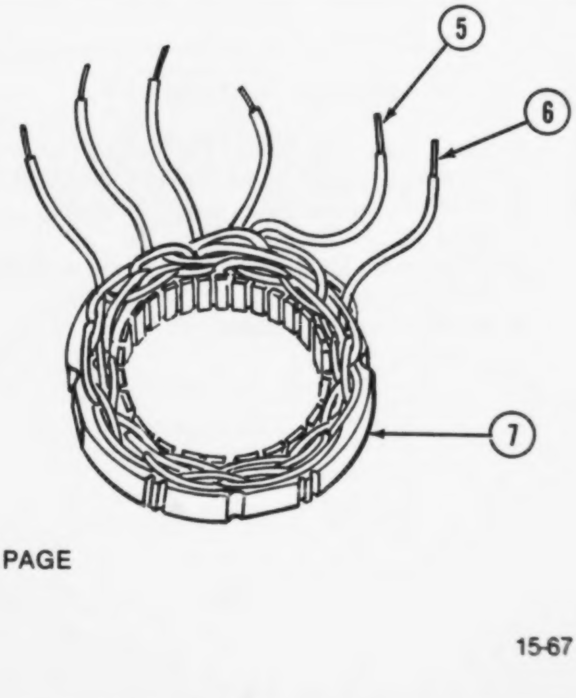
5. TEST STATOR ASSEMBLY CIRCUIT ONE.
   - Set multimeter to RX1 scale.
   - Position (+) probe of multimeter on lead (5).
   - Position ( – ) probe of multimeter on lead (6).
   - Check resistance reading at multimeter. Multimeter should read 0.05 — 0.15 ohm.
   - If reading at multimeter is not correct, stator assembly (7) is faulty.



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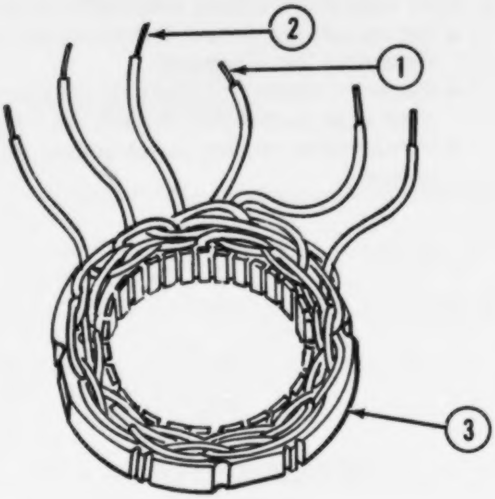
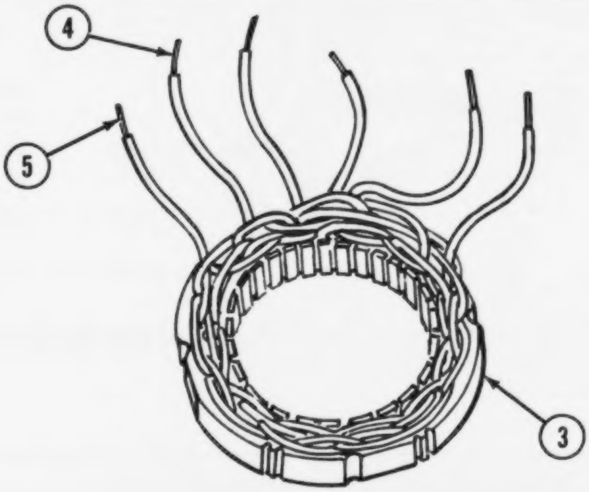
## U. DIODE AND STATOR ASSEMBLIES TESTS — Continued

6. TEST STATOR ASSEMBLY CIRCUIT TWO.
   - Set multimeter to RX 1 scale.
   - Position (+) probe of multimeter on lead (1).
   - Position (−) probe of multimeter on lead (2).
   - Check resistance reading at multimeter. Multimeter should read 0.05 — 0.15 ohm.
   - If reading at multimeter is not correct, stator assembly (3) is faulty.

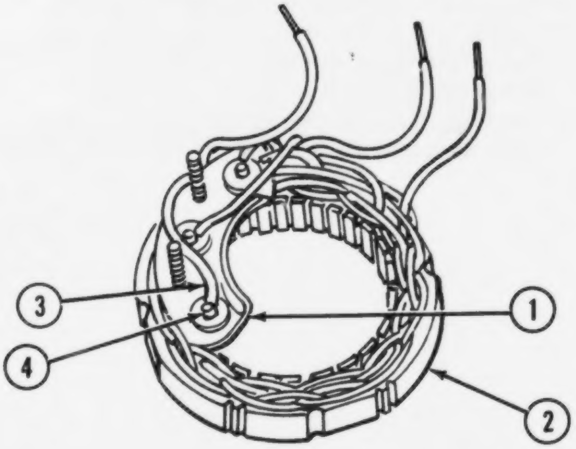


7. TEST STATOR ASSEMBLY CIRCUIT THREE.
   - Set multimeter to RX 1 scale.
   - Position (+) probe of multimeter on lead (4).
   - Position (−) probe of multimeter on lead (5).
   - Check resistance reading at multimeter. Multimeter should read 0.05 — 0.15 ohm.
   - If reading at multimeter is not correct, stator assembly (3) is faulty.

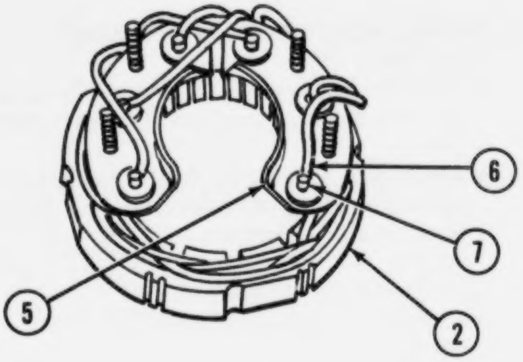


## V. STATOR ASSEMBLY REASSEMBLY

1. INSTALL POSITIVE DIODE ASSEMBLY ON STATOR ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Position positive diode assembly (1) on stator (2).
   - Solder three leads (3) at three positive diode terminals (4). (See TM 55-1500-323-25.)
   - Remove tags from leads.



2. INSTALL NEGATIVE DIODE ASSEMBLY ON STATOR ASSEMBLY. (SEE TM 55-1500-323-25.)
   - Position negative diode assembly (5) on stator (2).
   - Solder three leads (6) at three negative diode terminals (7). (See TM 55-1500-323-25.)
   - Remove tags from leads.



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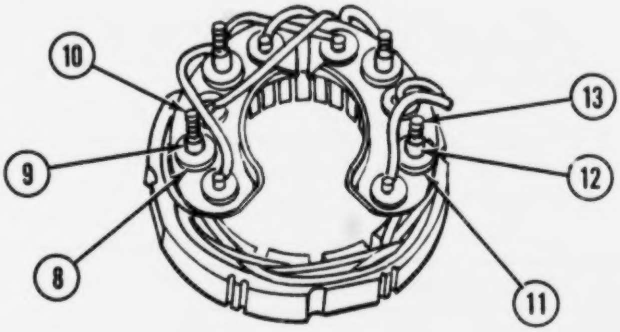
3. INSTALL TWO INSULATING SLEEVES AND WASHERS ON TWO DIODE ASSEMBLY TERMINALS.
   - Position two insulating washers (8) and sleeves (9) on two positive diode plate studs (10).
   - Position two insulating washers (11) and sleeves (12) on two negative diode plate studs (13).



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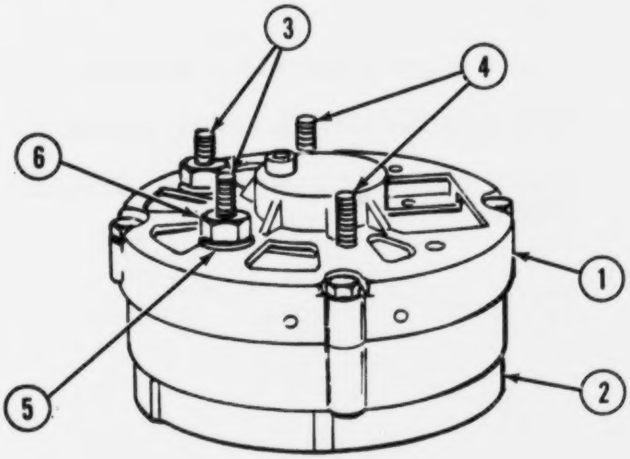
## W. STATOR ASSEMBLY AND REAR HOUSING INSTALLATION

1. INSTALL REAR HOUSING ON STATOR ASSEMBLY.
   - Position rear housing (1) on stator (2), with diode plate studs (3) and diode plate studs (4) alined.
   - Install four insulating washers (5) and two nuts (6) on diode plate studs (3). Use 3/8 inch open end wrench.



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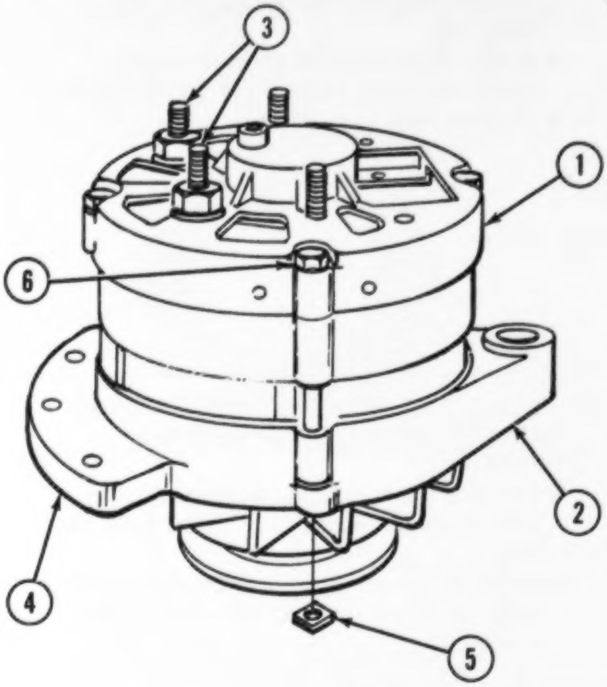
## W. STATOR ASSEMBLY AND REAR HOUSING INSTALLATION — Continued

2. INSTALL REAR HOUSING ON FRONT HOUSING.
   - Position rear housing (1) on front housing (2), with diode plate studs (3) toward flange (4).
   - Install rear housing (1), four nuts (5), and screws (6) on front housing (2). Use 1/4 inch handled socket wrench.
3. INSTALL BRUSH ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-61.)
4. INSTALL VOLTAGE REGULATOR ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-57.)
5. INSTALL SHIELD AND ISOLATION DIODE ASSEMBLIES ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
6. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)



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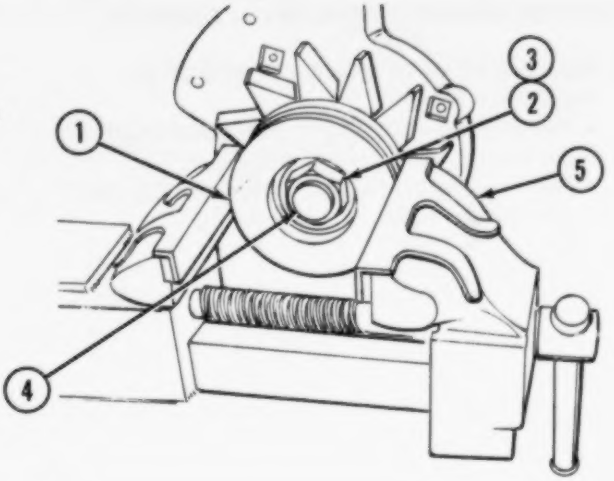
## X. ROTOR ASSEMBLY REMOVAL

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)
2. REMOVE SHIELD AND ISOLATION DIODE ASSEMBLIES FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-52.)
3. REMOVE VOLTAGE REGULATOR ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
4. REMOVE BRUSH ASSEMBLY FROM ALTERNATOR. (SEE ATERNATOR, PAGE 15-58.)
5. REMOVE STATOR ASSEMBLY AND REAR HOUSING FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-62.)

6. REMOVE ROTOR ASSEMBLY SHAFT FROM ALTERNATOR PULLEY.
   - Hold pulley (1). Use vise with vise caps.
   - Remove nut (2) and lock washer (3) from rotor shaft (4). Use 1 inch deep socket with ratchet handle. Discard lock washer.
   - Remove rotor shaft (4) from pulley (1).
   - Remove pulley (1) from vise (5).



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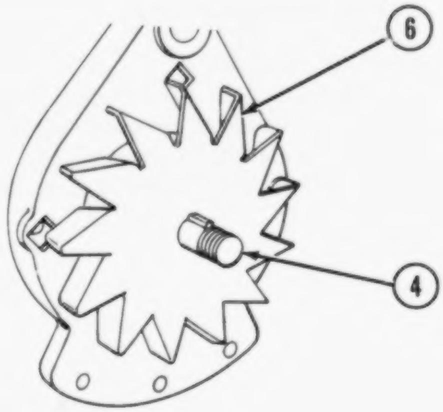
7. REMOVE FAN (6) FROM ROTOR ASSEMBLY SHAFT (4).



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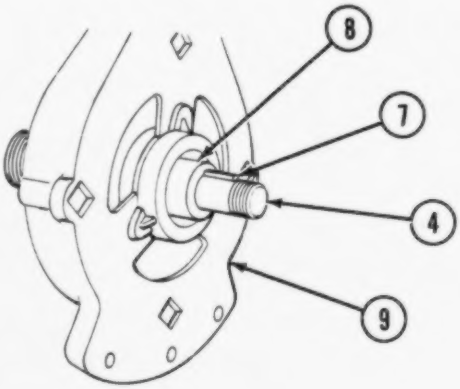
8. REMOVE FRONT HOUSING FROM ROTOR ASSEMBLY SHAFT.
   - Remove key (7) from rotor shaft (4). Use round nose pliers.
   - Remove spacer (8) from rotor shaft (4).
   - Tap housing (9) from rotor shaft (4). Use soft faced hammer.



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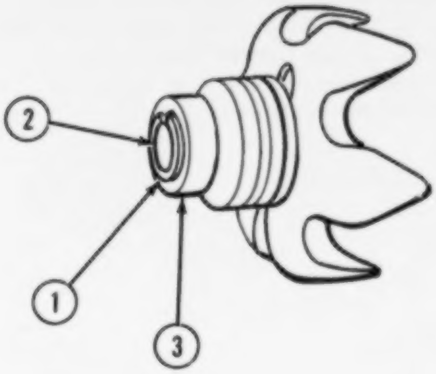
## X. ROTOR ASSEMBLY REMOVAL — Continued

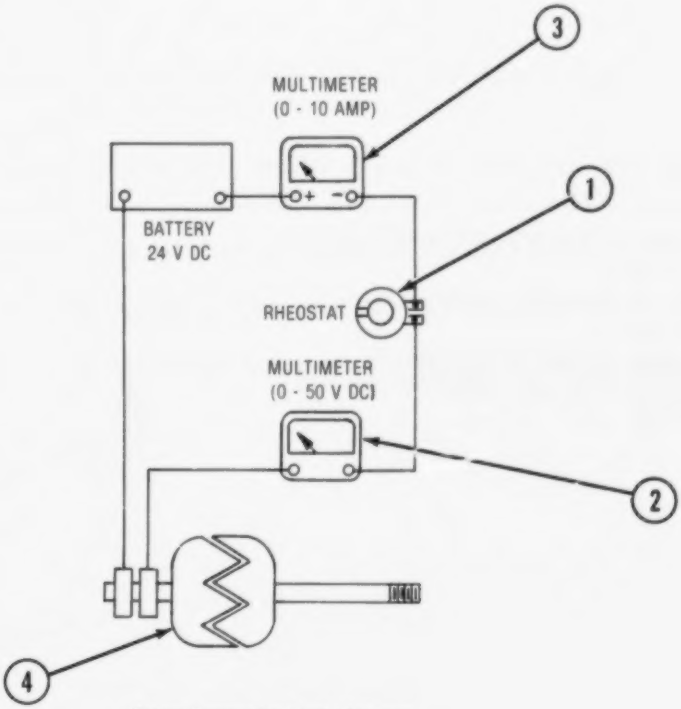
9. REMOVE REAR BEARING FROM ROTOR ASSEMBLY SHAFT.
   - Remove retaining ring (1) from rotor shaft (2). Use retaining ring pliers.
   - Remove bearing (3) from rotor shaft (2). Use mechanical puller.



## Y. ROTOR ASSEMBLY TEST

TEST ROTOR ASSEMBLY.

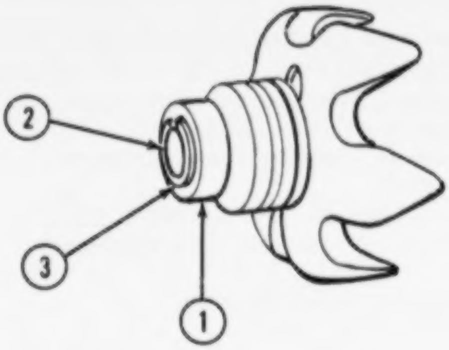
- Set up test equipment for rotor assembly test. (See following Rotor Assembly Test Diagram.)
- Adjust rheostat (1) until multimeter (2) reads 20 V dc.
- Check amperage reading at multimeter (3). Multimeter should read 1.25 — 1.88 amp.
- If reading at multimeter (3) is not correct, rotor assembly (4) is faulty.


3
MULTIMETER
(0 - 10 AMP)
+
−
BATTERY
24 V DC
1
RHEOSTAT
MULTIMETER
(0 - 50 V DC)
2
4

*Rotor Assembly Test Diagram*

## Z. ROTOR ASSEMBLY INSTALLATION

1. INSTALL REAR BEARING ON ROTOR ASSEMBLY SHAFT.
   - Slide bearing (1) on rotor shaft (2).
   - Install retaining ring (3) on rotor shaft (2). Use retaining ring pliers.



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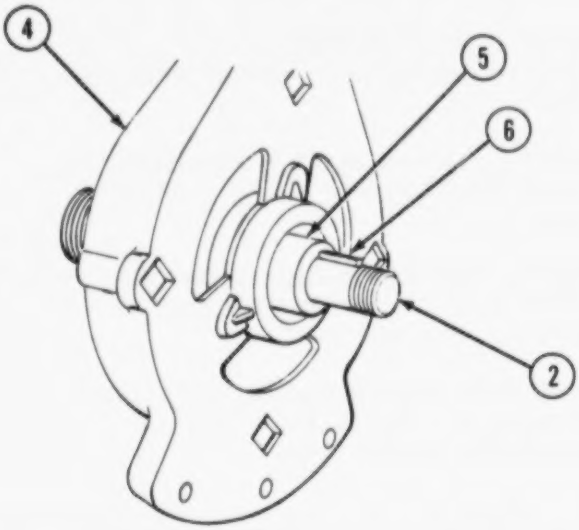
2. INSTALL FRONT HOUSING ON ROTOR ASSEMBLY SHAFT.
   - Slide housing (4) on rotor shaft (2).
   - Install spacer (5) on rotor shaft (2).
   - Install key (6) in rotor shaft (2).



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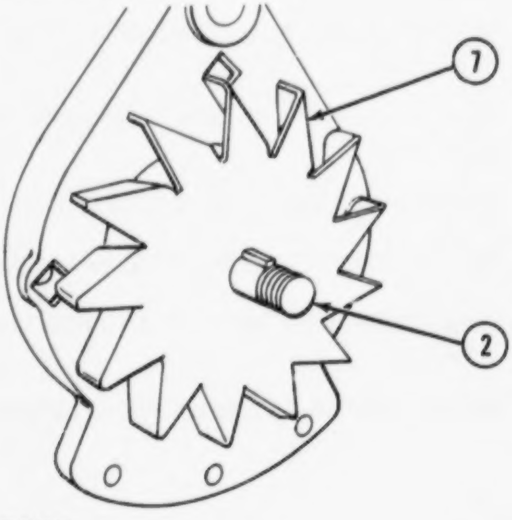
3. INSTALL FAN (7) ON ROTOR ASSEMBLY SHAFT (2).



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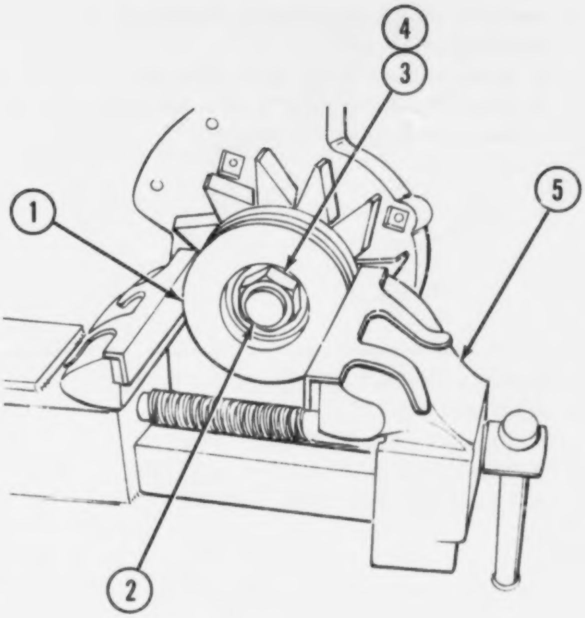
## Z. ROTOR ASSEMBLY INSTALLATION — Continued

4. INSTALL ROTOR ASSEMBLY SHAFT ON ALTERNATOR PULLEY.
   - Hold pulley (1). Use vise with vise caps.
   - Slide rotor shaft (2) into pulley (1).
   - Install new lock washer (3) and nut (4) on rotor shaft (2).
   - Torque nut (4) to 35 — 50 ft lb (4.8 — 6.9 mkg). Use 1 inch deep socket with torque wrench.
   - Remove pulley (1) from vise (5).



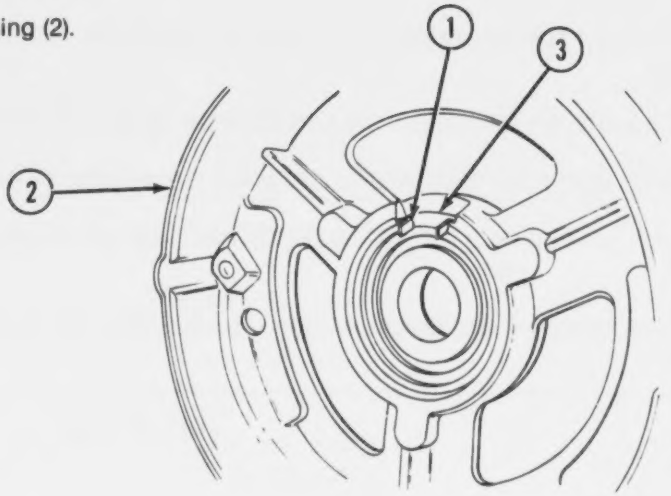
5. INSTALL STATOR ASSEMBLY AND REAR HOUSING ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-69.)
6. INSTALL BRUSH ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-61.)
7. INSTALL VOLTAGE REGULATOR ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-57.)
8. INSTALL SHIELD AND ISOLATION DIODE ASSEMBLIES ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
9. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)

---

## AA. FRONT HOUSING DISASSEMBLY

1. REMOVE COVER AND CONNECTOR PLUG ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-42.)
2. REMOVE SHIELD AND ISOLATION DIODE ASSEMBLIES FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-52.)
3. REMOVE VOLTAGE REGULATOR ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
4. REMOVE BRUSH ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-58.)
5. REMOVE STATOR ASSEMBLY AND REAR HOUSING FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-62.)
6. REMOVE ROTOR ASSEMBLY FROM ALTERNATOR. (SEE ALTERNATOR, PAGE 15-70.)

7. REMOVE RETAINING RING AND FRONT BEARING FROM FRONT HOUSING.
   - Remove retaining ring (1) from front housing (2). Use retaining ring pliers.
   - Remove bearing (3) from front housing (2). Use arbor press.



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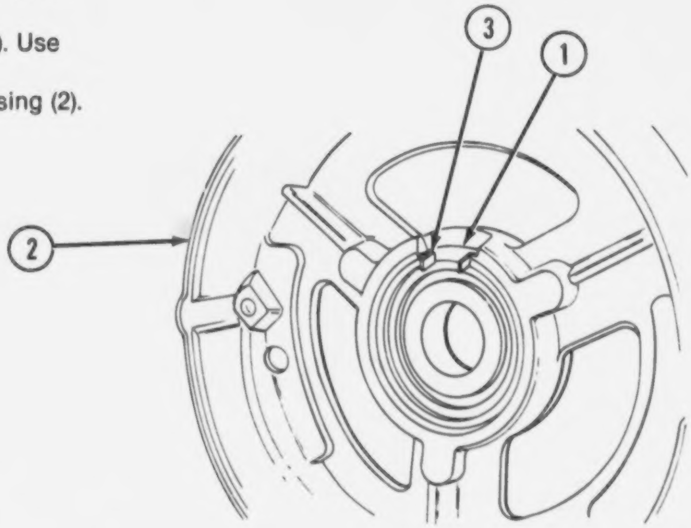
## AB. FRONT HOUSING REASSEMBLY

1. INSTALL FRONT BEARING AND RETAINING RING ON FRONT HOUSING.
   - Install bearing (1) in front housing (2). Use arbor press.
   - Install retaining ring (3) on front housing (2). Use retaining ring pliers.



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**AB. FRONT HOUSING REASSEMBLY — Continued**

2. INSTALL ROTOR ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-73.)
3. INSTALL STATOR ASSEMBLY AND REAR HOUSING ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-69.)
4. INSTALL BRUSH ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-61.)
5. INSTALL VOLTAGE REGULATOR ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-57.)
6. INSTALL SHIELD AND ISOLATION DIODE ASSEMBLIES ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-55.)
7. INSTALL COVER AND CONNECTOR PLUG ASSEMBLY ON ALTERNATOR. (SEE ALTERNATOR, PAGE 15-45.)

---

END OF TASK

## 15-9 BRACKET ASSEMBLY

**DESCRIPTION**

This task covers:
A. REMOVAL (p 15-77)
B. DISASSEMBLY (p 15-78)
C. REASSEMBLY (p 15-78)
D. INSTALLATION (p 15-79)

---

**INITIAL SETUP**

***Tools and Special Tools:***
General mechanic's tool kit
5180-00-177-7033:
3/4 inch socket
Ratchet handle
Retaining ring pliers 5120-00-293-0045
Arbor press 3444-00-449-7295

***Materials/Parts:***
Self-locking nut (28265) 1511-02624
Lock washer (2)

***References:***
TM 9-1095-205-10
TM 9-1095-205-20

---

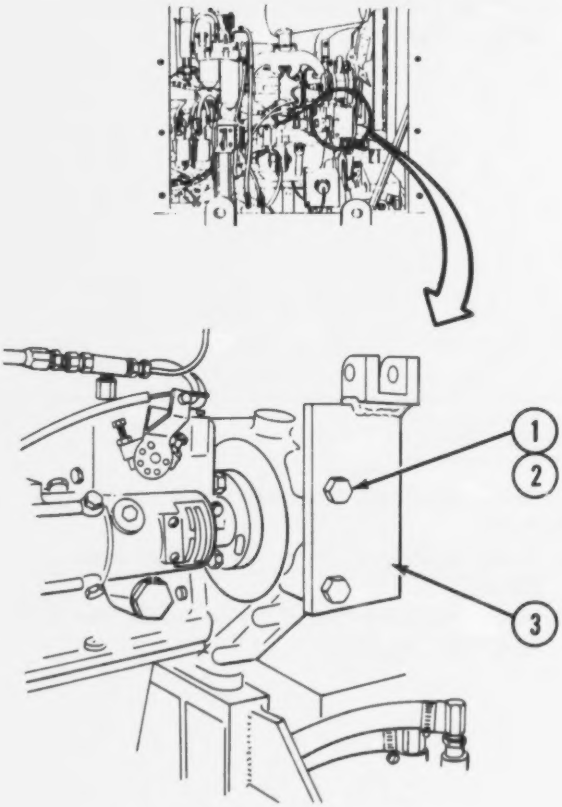
**A. REMOVAL**

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Alternator. (See TM 9-1095-205-20.)

REMOVE BRACKET ASSEMBLY FROM ENGINE.

- Remove two screws (1), lock washers (2), and bracket assembly (3) from engine. Use 3/4 inch socket with ratchet handle. Discard lock washers.



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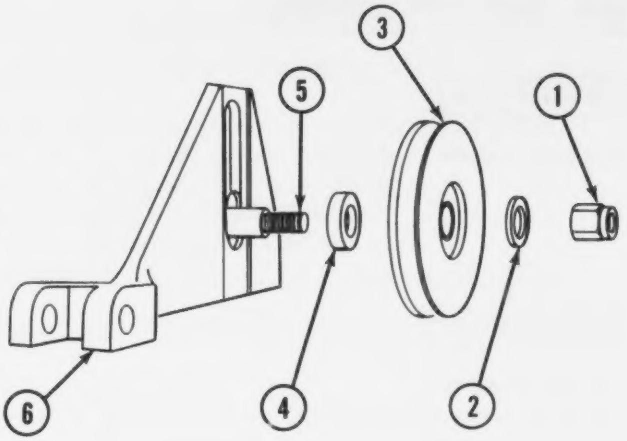
## 15-9 BRACKET ASSEMBLY — Continued

### B. DISASSEMBLY

1. REMOVE PULLEY AND BEARING ASSEMBLY FROM BRACKET.
   - Remove self-locking nut (1), washer (2), pulley and bearing assembly (3), bushing (4), and pulley shaft (5) from bracket (6). Use 3/4 inch socket with ratchet handle. Discard self-locking nut.



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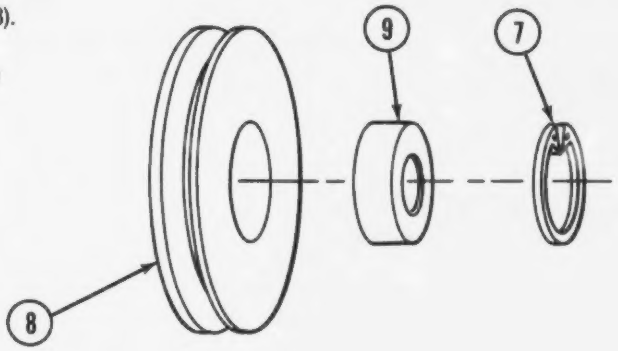
2. REMOVE RETAINING RING AND BEARING FROM PULLEY.
   - Remove retaining ring (7) from pulley (8). Use retaining ring pliers.
   - Remove bearing (9) from pulley (8). Use arbor press.



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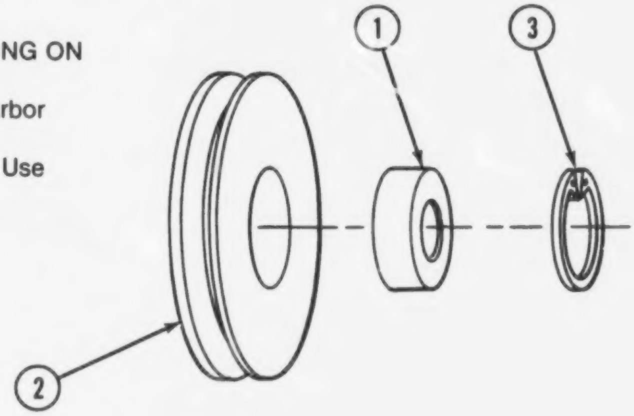
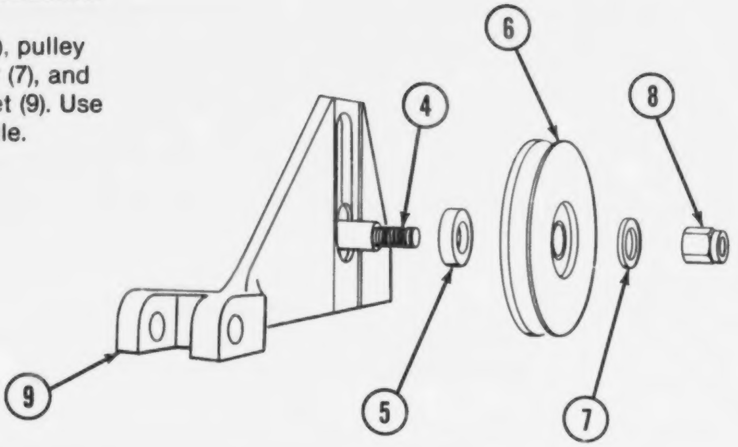
### C. REASSEMBLY

1. INSTALL BEARING AND RETAINING RING ON PULLEY.
   - Install bearing (1) on pulley (2). Use arbor press.
   - Install retaining ring (3) on pulley (2). Use retaining ring pliers.



2. INSTALL PULLEY AND BEARING ASSEMBLY ON BRACKET.
   - Install pulley shaft (4), bushing (5), pulley and bearing assembly (6), washer (7), and new self-locking nut (8) on bracket (9). Use 3/4 inch socket with ratchet handle.



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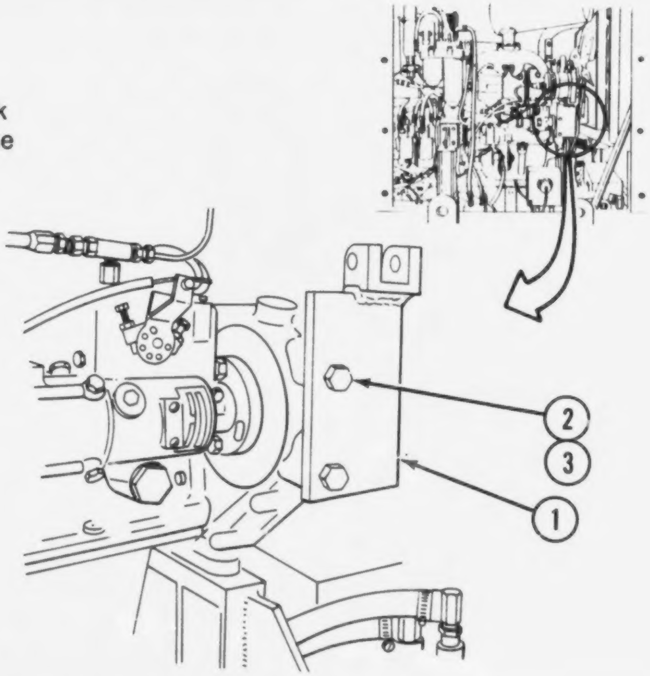
## D. INSTALLATION

INSTALL BRACKET ASSEMBLY ON ENGINE.
- Install bracket assembly (1), two new lock washers (2), and screws (3) on engine. Use 3/4 inch socket with ratchet handle.



NOTE

***FOLLOW-ON MAINTENANCE:***

Install Alternator. (See TM 9-1095-205-20.)
Adjust Alternator Drive Belt. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

END OF TASK

## 15-10 ALTERNATOR ADJUSTING STRAP

**DESCRIPTION**

This task covers: A. REMOVAL (p 15-81)
B. INSTALLATION (p 15-82)

---

**INITIAL SETUP**

***Tools and Special Tools:***
General mechanic's tool kit
5180-00-177-7033:
1/2 inch socket
5/8 inch socket
Ratchet handle

***Materials/Parts:***
Lock washer 5310-00-010-3320
Lock washer 5310-00-584-5272

***References:***
TM 9-1095-205-10
TM 9-1095-205-20

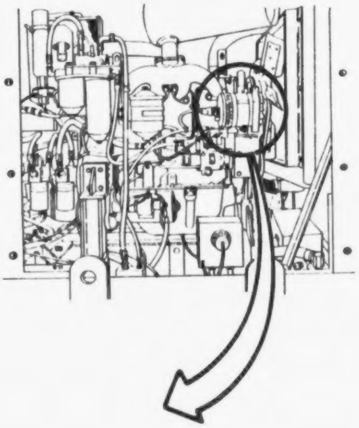
---

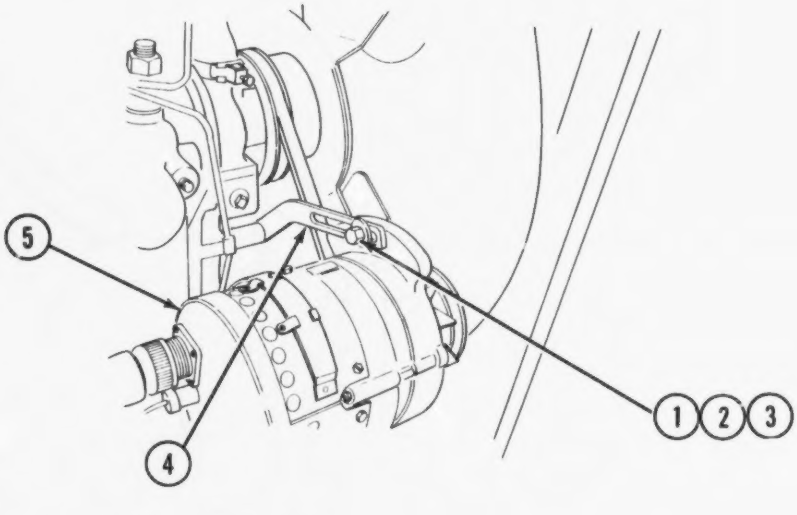
**A. REMOVAL**

**NOTE**

***PRELIMINARY PROCEDURE:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

1. REMOVE ALTERNATOR ADJUSTING STRAP FROM ALTERNATOR.
   - Remove screw (1), lock washer (2), washer (3), and adjusting strap (4) from alternator (5). Use 1/2 inch socket with ratchet handle. Discard lock washer.





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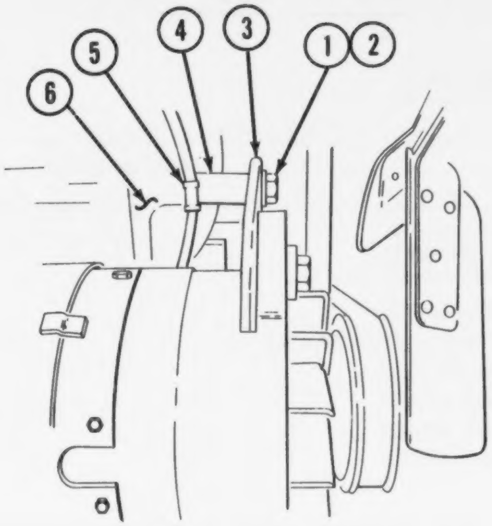
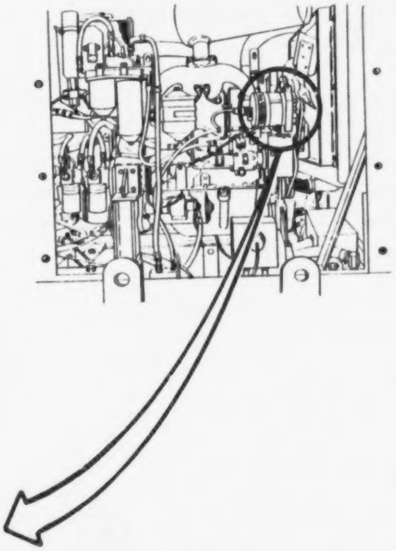
## A. REMOVAL — Continued

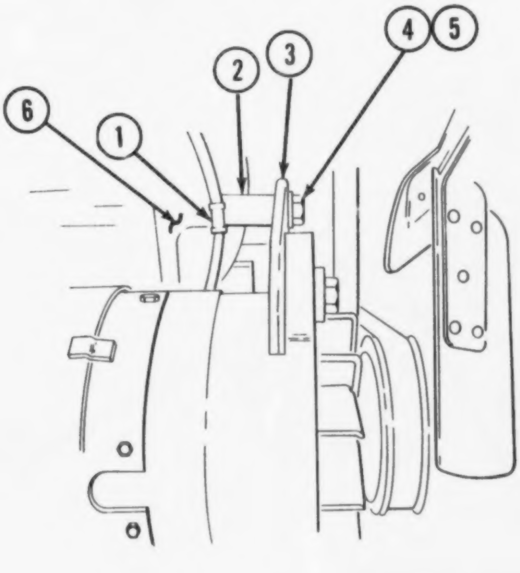
2. REMOVE ALTERNATOR ADJUSTING STRAP FROM WATER PUMP.
   - Remove bolt (1), lock washer (2), adjusting strap (3), spacer (4), and fuel line clamp (5) from water pump (6). Use 5/8 inch socket with ratchet handle. Discard lock washer.



## B. INSTALLATION

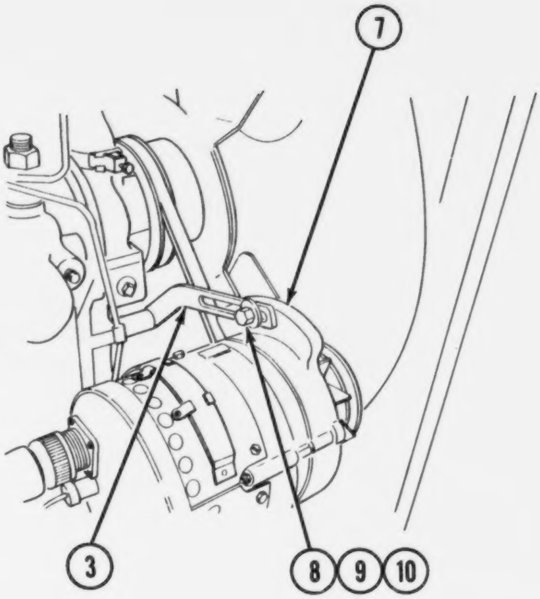
1. INSTALL ALTERNATOR ADJUSTING STRAP ON WATER PUMP.
   - Install fuel line clamp (1), spacer (2), adjusting strap (3), new lock washer (4), and bolt (5) on water pump (6). Do not tighten.





2. INSTALL ADJUSTING STRAP ON ALTERNATOR.
   - Aline slot in adjusting strap (3) with middle hole in top of alternator (7).
   - Install washer (8), new lock washer (9), and screw (10) on adjusting strap (3). Do not tighten.

3. ADJUST ALTERNATOR DRIVE BELT. (SEE TM 9-1095-205-20.)



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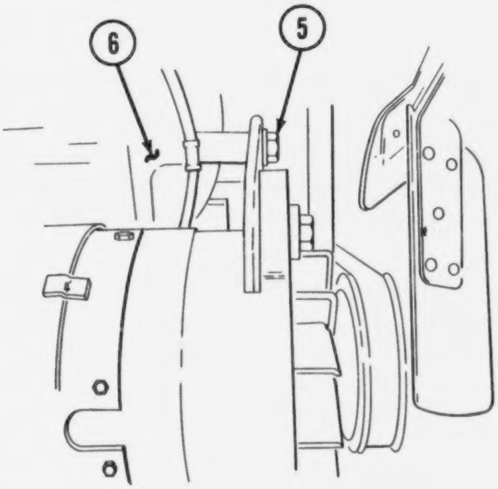
4. TIGHTEN BOLT ON WATER PUMP.
   - Tighten bolt (5) on water pump (6). Use 5/8 inch socket with ratchet handle.

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



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END OF TASK

## 15-11 WATER PUMP ASSEMBLY

### DESCRIPTION

This task covers:
A. DISASSEMBLY (p 15-85)
B. REASSEMBLY (p 15-87)

### INITIAL SETUP

***Tools and Special Tools:***
General mechanic's tool kit
  5180-00-177-7033:
    3/8 inch flat tip screwdriver
    1/2 inch socket
    Ratchet handle
    6 inch steel rule
    Thickness gage
Electric impact wrench 5120-00-221-0607
5/16 inch flat tip screwdriver bit
  5130-00-240-5252
Arbor press 3440-00-449-7295
Arbor press puller attachment 5120-00-711-6753
Leather gloves 8415-00-268-7859
Retaining ring pliers 5120-00-293-0045

***Materials/Parts:***
Pump repair kit 2930-00-678-3818
Lock washer 5310-00-010-3320
Grease, Item 11, Appendix B

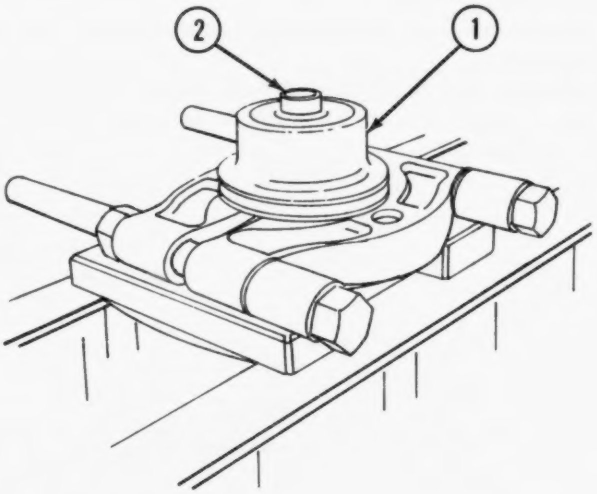
***Personnel Required:***
Mechanic
Helper

### OVERVIEW

This procedure tells how to repair the water pump assembly. Install the water pump repair kit when original housing and pulley are useable. Replace entire water pump assembly when original water pump housing and pulley are not useable.

### A. DISASSEMBLY

1. REMOVE PULLEY FROM WATER PUMP ASSEMBLY.
   - Press pulley (1) from shouldered shaft (2). Use arbor press with arbor press puller attachment.



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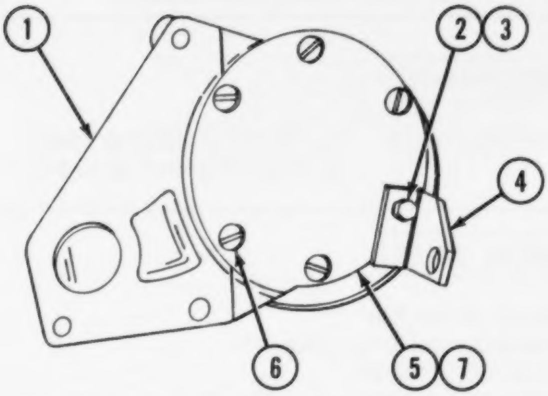
**A. DISASSEMBLY — Continued**

2. REMOVE PUMP COVER FROM WATER PUMP ASSEMBLY.
   - Have helper hold water pump assembly (1). Have helper wear leather gloves. Remove screw (2), lock washer (3), and bracket (4) from cover (5). Use 1/2 inch socket with ratchet handle. Discard lock washer.
   - Remove five screws (6), cover (5), and gasket (7) from water pump assembly (1). Use electric impact wrench with 5/16 inch flat tip screwdriver bit. Discard gasket.



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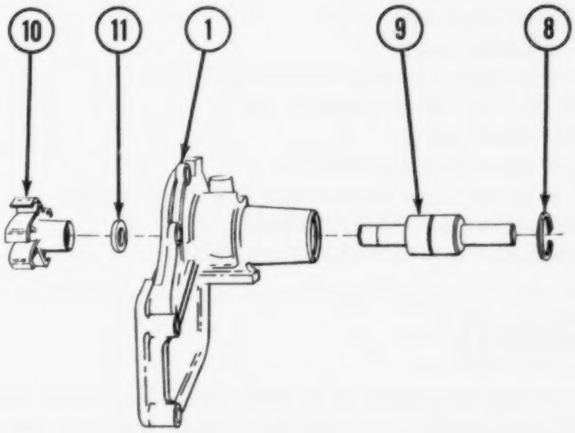
3. REMOVE SHOULDERED SHAFT FROM WATER PUMP ASSEMBLY.
   - Remove retaining ring (8) from water pump assembly (1). Use retaining ring pliers. Discard retaining ring.
   - Press shaft (9) out of impeller (10) and water pump assembly (1). Use arbor press. Discard shaft.
   - Remove impeller (10) and flinger (11) from water pump assembly (1). Discard impeller and flinger.



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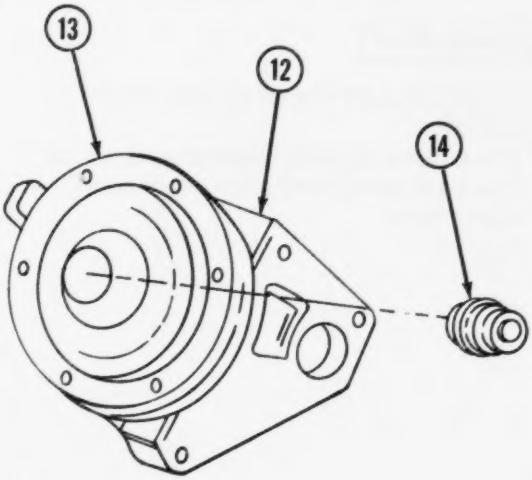
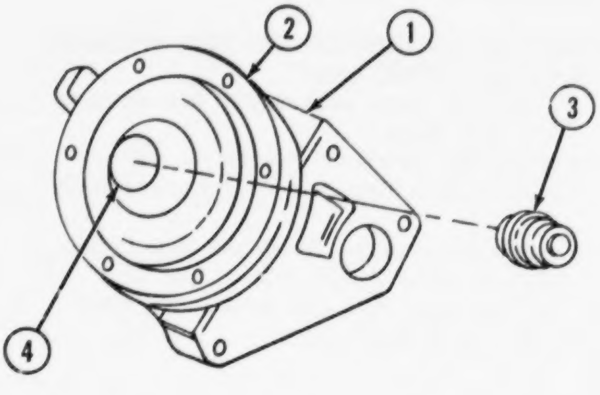
4. REMOVE SEAL ASSEMBLY FROM WATER PUMP BODY.
   - Turn water pump body (12) so cover end (13) is down.
   - Remove seal assembly (14) from water pump body (12). Use arbor press. Discard seal assembly.



## B. REASSEMBLY



**CAUTION**

Seal assembly can be easily damaged. Press only on outer flange of seal assembly when installing seal assembly.

1. INSTALL NEW SEAL ASSEMBLY ON WATER PUMP BODY.
   - Turn water pump body (1) over so cover end (2) is up.
   - Seat seal assembly (3) in pump body bore (4). Use arbor press.

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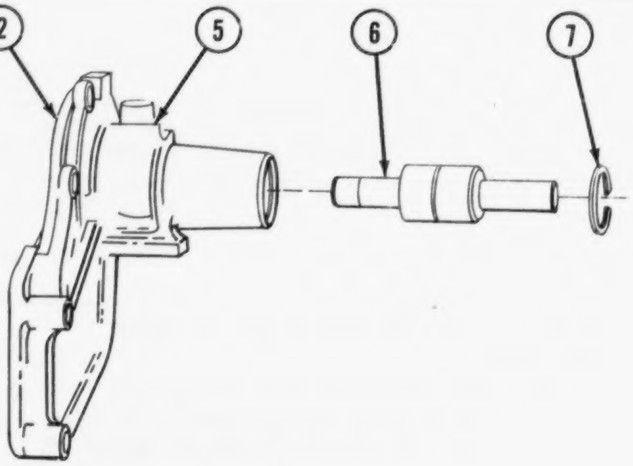

**CAUTION**

Shouldered shaft bearings can be damaged if you press on shouldered shaft. Press only on outer bearing race when installing shouldered shaft.

2. INSTALL NEW SHOULDERED SHAFT ON WATER PUMP ASSEMBLY.
   - Turn water pump assembly (5) over so cover end (2) is down.
   - Apply light coat of grease to shaft seal contact end (6).
   - Seat shaft seal contact end (6) in water pump assembly (5). Use arbor press.
   - Install new retaining ring (7) on water pump assembly (5). Use retaining ring pliers.

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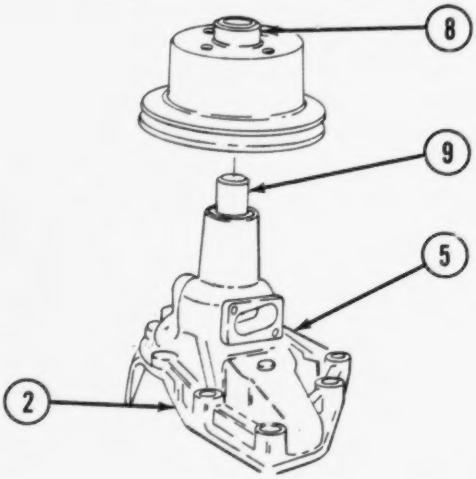

**CAUTION**

Shouldered shaft bearings can be damaged during pulley installation if shouldered shaft is forced out of water pump assembly. Support impeller end of shouldered shaft during pulley installation.

3. INSTALL PULLEY ON WATER PUMP ASSEMBLY.
   - Turn water pump assembly (5) over so cover end (2) is up.
   - Press pulley (8) on shaft (9) until outer end of pulley (8) is flush with shaft (9). Use arbor press.

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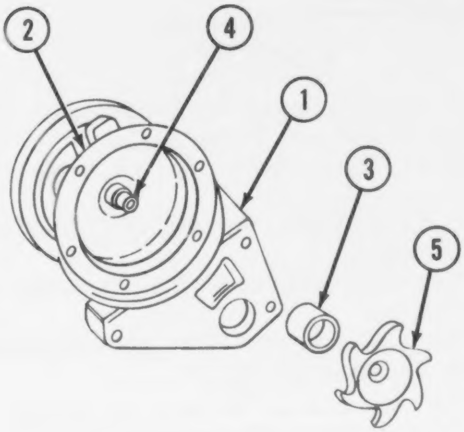
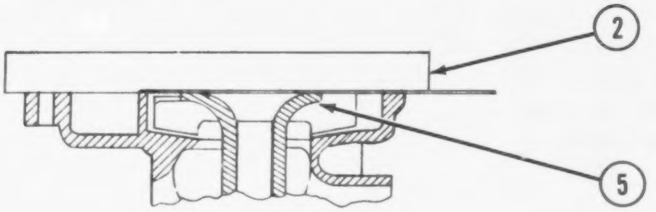
**B. REASSEMBLY — Continued**

4. INSTALL NEW FLINGER AND NEW IMPELLER ON SHOULDERED SHAFT.
   - Turn water pump assembly (1) over so cover end (2) is down.
   - Install new flinger (3) on shaft (4), with ceramic face towards water pump assembly (1).
   - Press new impeller (5) on shaft (4) until gap between cover end (2) and impeller (5) is 0.010 in. (0.26 mm). Use arbor press, steel rule, and thickness gage.





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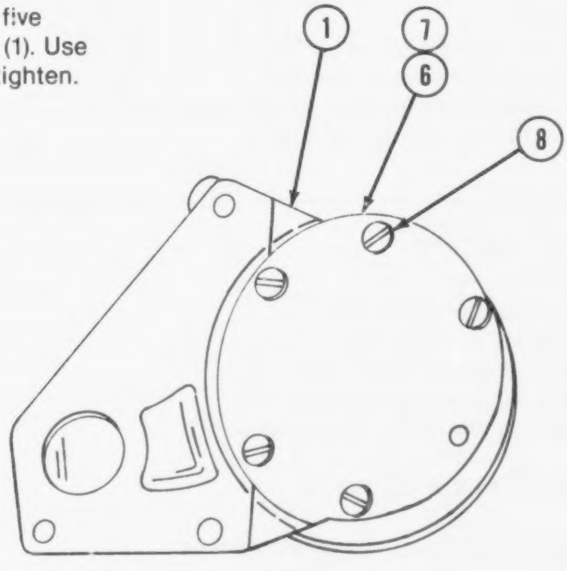
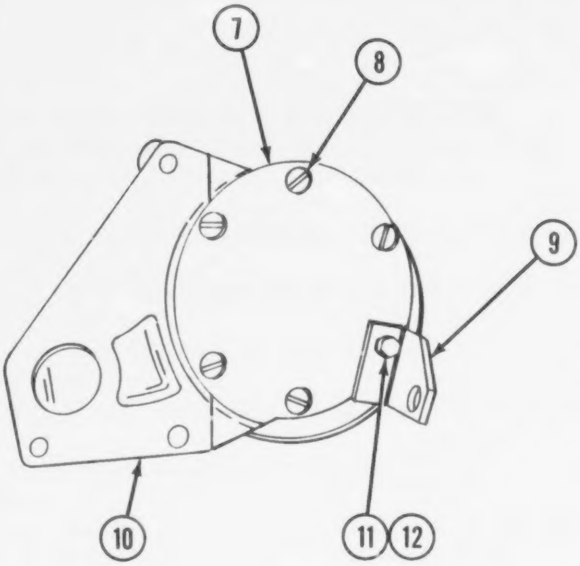
5. INSTALL PUMP COVER ON WATER PUMP ASSEMBLY.
   - Install new gasket (6), cover (7), and five screws (8) on water pump assembly (1). Use 3/8 inch flat tip screwdriver. Do not tighten.



- Position bottom of bracket (9) even with pump body base (10).
- Install bracket (9), new lock washer (11), and screw (12) on cover (7). Use 1/2 inch socket with ratchet handle.
- Tighten five screws (8). Use 3/8 inch flat tip screwdriver.



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END OF TASK

## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET

**DESCRIPTION**

This task covers:
A. RETURN TO TANK PALLET TUBE ASSEMBLY REMOVAL (p 15-93)
B. RETURN TO TANK PALLET TUBE ASSEMBLY INSTALLATION (p 15-94)
C. SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY REMOVAL (p 15-96)
D. SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY INSTALLATION (p 15-97)
E. ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY REMOVAL (p 15-99)
F. ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY INSTALLATION (p 15-100)
G. FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY REMOVAL (p 15-101)
H. FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY INSTALLATION (p 15-102)
I. ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY REMOVAL (p 15-103)
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U. FUEL FILTER BRACKET REMOVAL (p 15-123)
V. FUEL FILTER BRACKET INSTALLATION (p 15-125)

**INITIAL SETUP**

*Tools and Special Tools:*
General mechanic's tool kit
5180-00-177-7033:
- 11/16 inch open end wrench (2)
- No. 2 cross tip screwdriver
- 3/8 inch box end wrench
- 7/16 inch socket
- 9/16 inch socket
- 1/2 inch open end wrench
- 3/4 inch open end wrench
- 13/16 inch open end wrench

*Tools and Special Tools — Continued:*
- 5/8 inch socket
- Ratchet handle
- 5 inch extension
- 9/16 inch box end wrench
- 7/16 inch box end wrench
- 9/16 inch open end wrench
- 6 inch adjustable wrench

9/16 inch box and open end box wrench
5120-00-895-9570

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

***Tools and Special Tools — Continued:***

11/16 inch box and open end box wrench 5120-00-228-9509
Cap and plug set 5340-00-450-5718
No. 2 offset cross tip screwdriver 5120-00-256-9014

***Materials/Parts:***

Self-locking nut 5310-00-088-1251
Self-locking nut (2) 5310-00-087-4652
Self-locking nut (4) 5310-00-877-5797
Lock washer (3) 5310-00-209-0965

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
COLD START ASSEMBLY AND AIR FILTER SERVICE AIR INDICATOR SYSTEM, Page 15-3

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

---

**OVERVIEW**

Fuel lines have fuel in them. Loosen tube nuts and hose couplings slowly. Catch fuel with rags or in suitable container. Wipe up spilled fuel. Dispose of drained fuel according to local procedures.

If you remove or disconnect more than one tube assembly or hose assembly, tag and mark each one. Remove tags after installing or connecting tube assemblies or hose assemblies.

Tube assemblies are not supplied as parts. If you need a new tube assembly, see Appendix C, and make one. See:

9290446 return to tank pallet tube assembly
9290447 suction to fuel pump pallet tube assembly

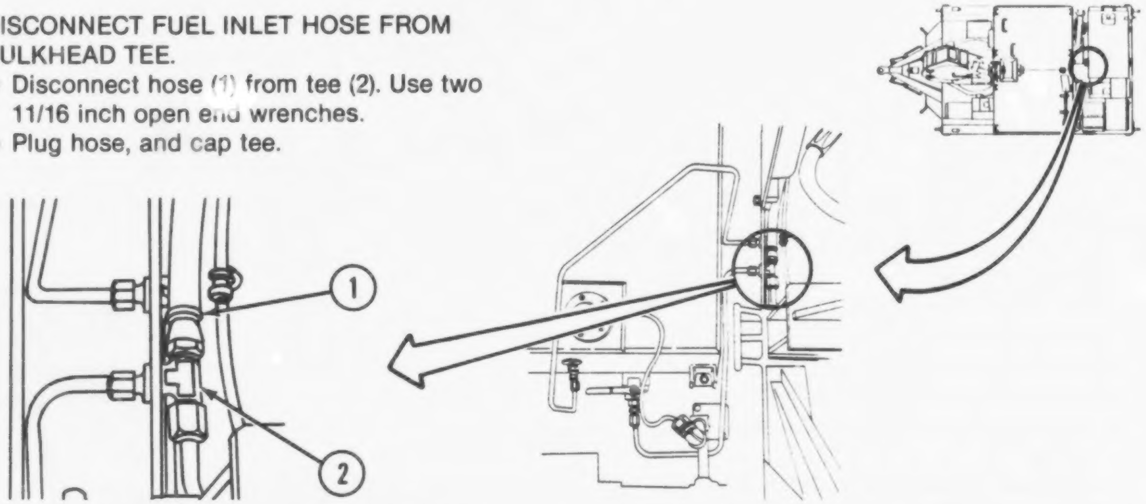
## A. RETURN TO TANK PALLET TUBE ASSEMBLY REMOVAL

**NOTE**

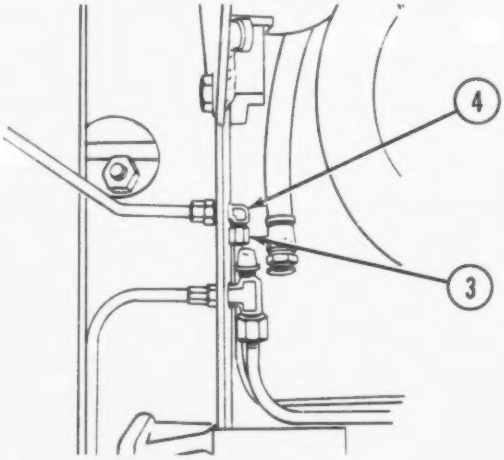
***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT FUEL INLET HOSE FROM BULKHEAD TEE.
   - Disconnect hose (1) from tee (2). Use two 11/16 inch open end wrenches.
   - Plug hose, and cap tee.



2. DISCONNECT RETURN TO TANK PALLET TUBE ASSEMBLY FROM PALLET BULKHEAD ELBOW.
   - Disconnect tube (3) from elbow (4). Use 9/16 inch box and open end box wrench.
   - Plug tube, and cap elbow.



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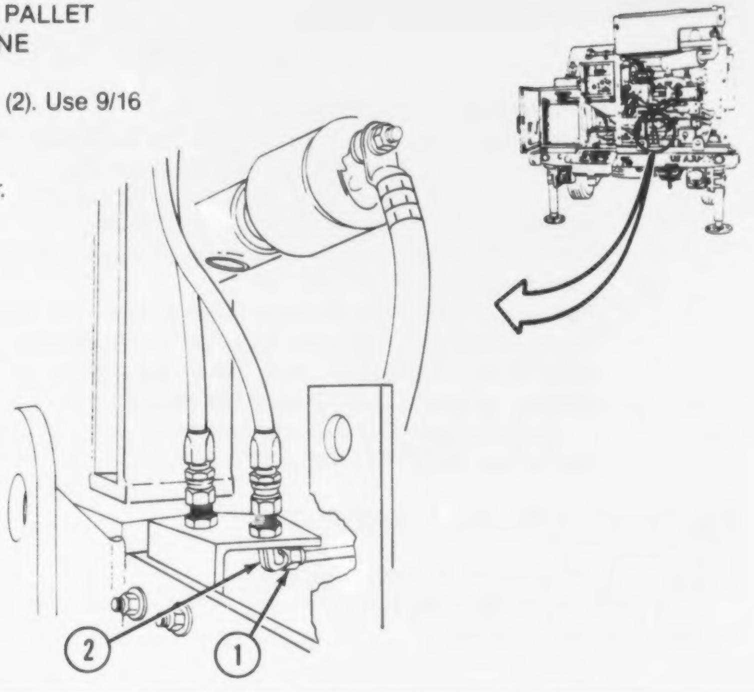
## A. RETURN TO TANK PALLET TUBE ASSEMBLY REMOVAL — Continued

3. DISCONNECT RETURN TO TANK PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW.
   - Disconnect tube (1) from elbow (2). Use 9/16 inch open end wrench.
   - Plug tube, and cap elbow.
   - Remove tube (1) from dispenser.



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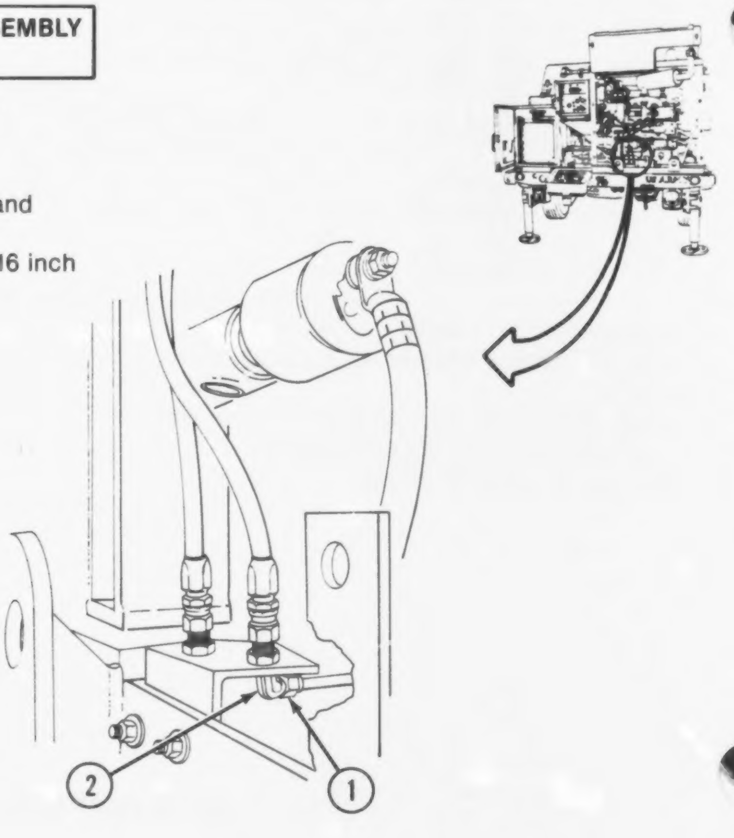
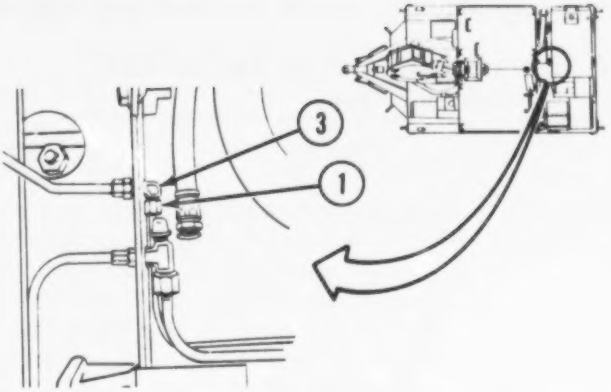
## B. RETURN TO TANK PALLET TUBE ASSEMBLY INSTALLATION

1. CONNECT RETURN TO TANK PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW.
   - Remove plug and cap from tube (1) and elbow (2).
   - Connect tube (1) to elbow (2). Use 9/16 inch open end wrench.



2. CONNECT RETURN TO TANK PALLET TUBE ASSEMBLY TO PALLET BULKHEAD ELBOW.
   - Remove plug and cap from tube (1) and elbow (3).
   - Connect tube (1) to elbow (3). Use 9/16 inch box and open end box wrench.



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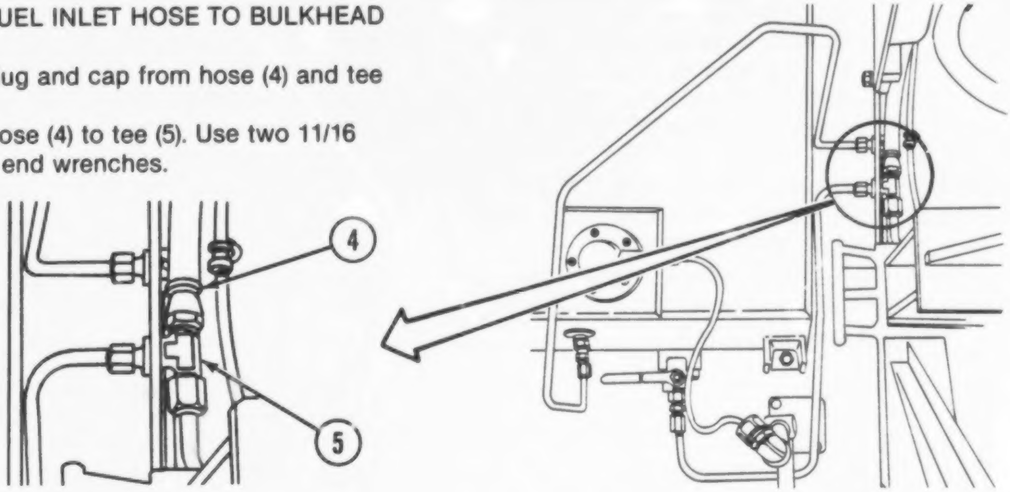
3. CONNECT FUEL INLET HOSE TO BULKHEAD TEE.
   - Remove plug and cap from hose (4) and tee (5).
   - Connect hose (4) to tee (5). Use two 11/16 inch open end wrenches.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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## 15-12 ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET—Continued

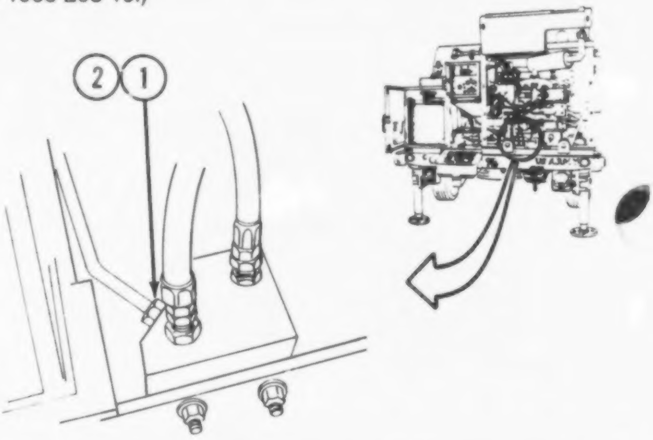
### C. SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

1. DISCONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW.
   - Disconnect tube (1) from elbow (2). Use 11/16 inch box and open end box wrench.
   - Plug tube, and cap elbow.



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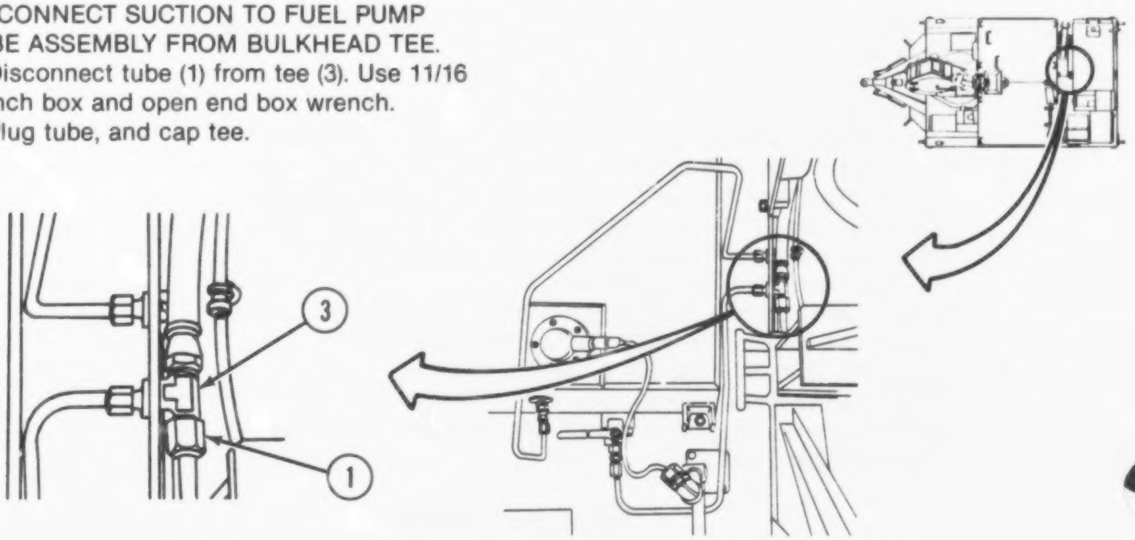
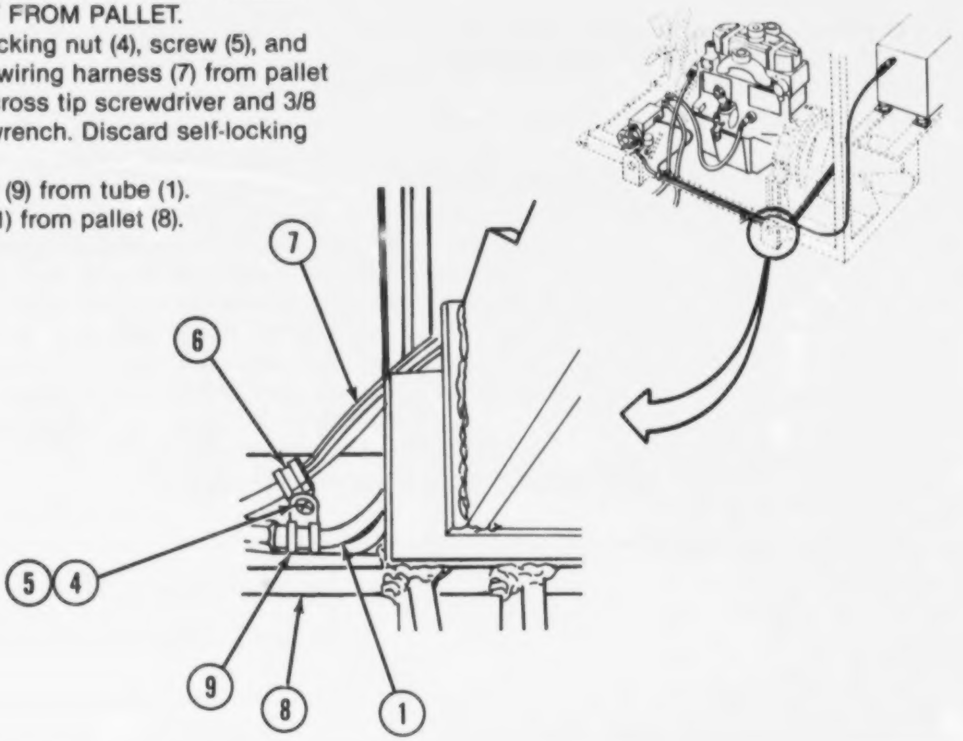
2. DISCONNECT SUCTION TO FUEL PUMP TUBE ASSEMBLY FROM BULKHEAD TEE.
   - Disconnect tube (1) from tee (3). Use 11/16 inch box and open end box wrench.
   - Plug tube, and cap tee.



3. REMOVE SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY FROM PALLET.
   - Remove self-locking nut (4), screw (5), and clamp (6) with wiring harness (7) from pallet (8). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench. Discard self-locking nut.
   - Remove clamp (9) from tube (1).
   - Remove tube (1) from pallet (8).



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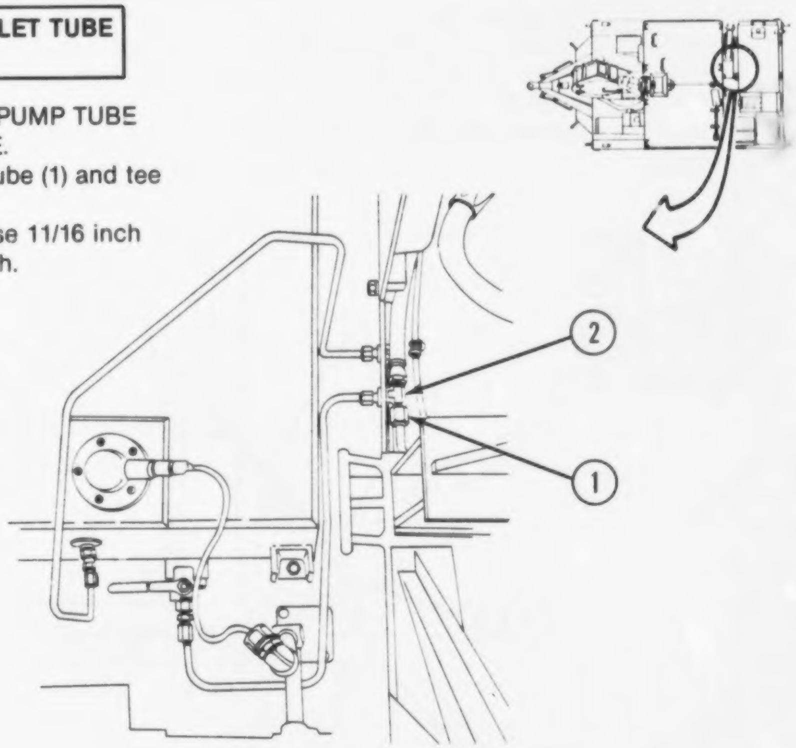
## D. SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY INSTALLATION

1. CONNECT SUCTION TO FUEL PUMP TUBE ASSEMBLY TO BULKHEAD TEE.
   - Remove plug and cap from tube (1) and tee (2).
   - Connect tube (1) to tee (2). Use 11/16 inch box and open end box wrench.



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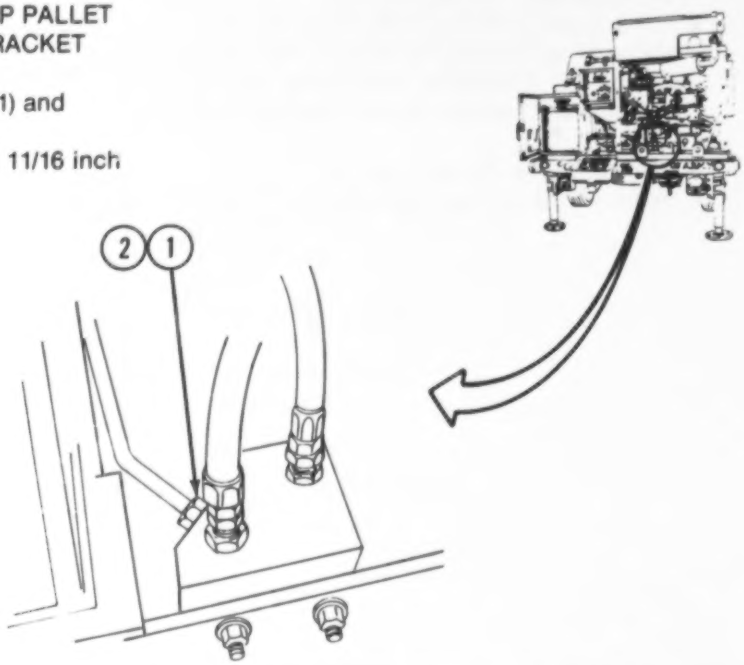
## D. SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY INSTALLATION — Continued

2. CONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW.
   - Remove plug and cap from tube (1) and elbow (2).
   - Connect tube (1) to elbow (2). Use 11/16 inch box and open end box wrench.



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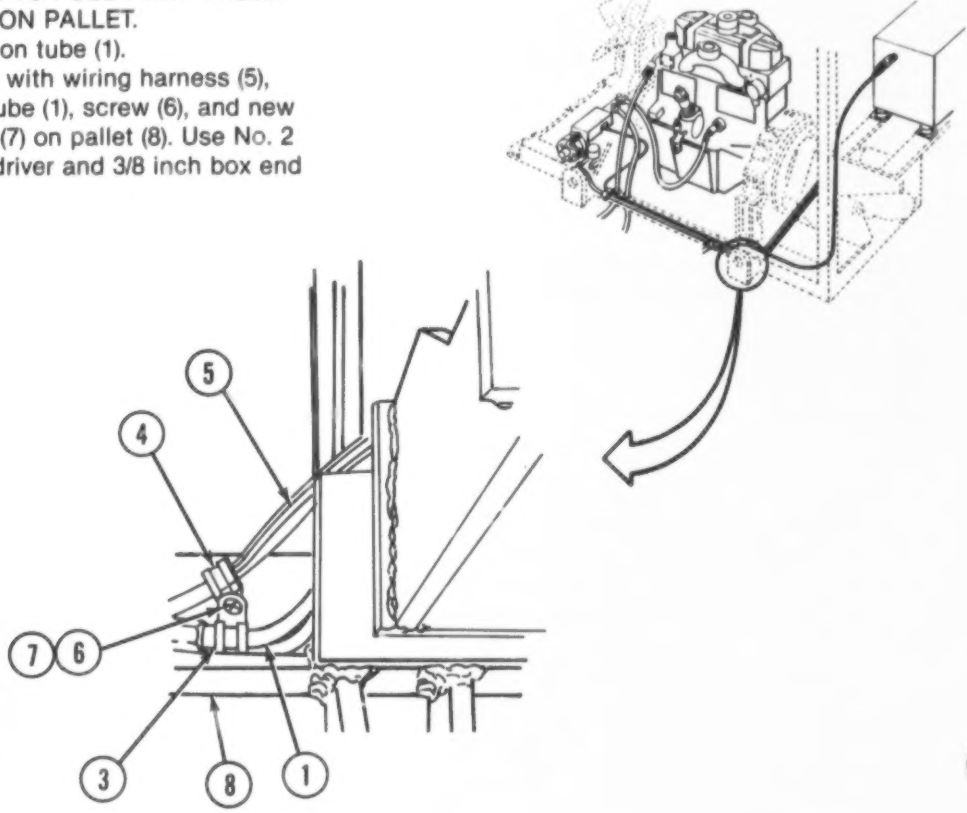
3. INSTALL SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY ON PALLET.
   - Place clamp (3) on tube (1).
   - Install clamp (4) with wiring harness (5), clamp (3) with tube (1), screw (6), and new self-locking nut (7) on pallet (8). Use No. 2 cross tip screwdriver and 3/8 inch box end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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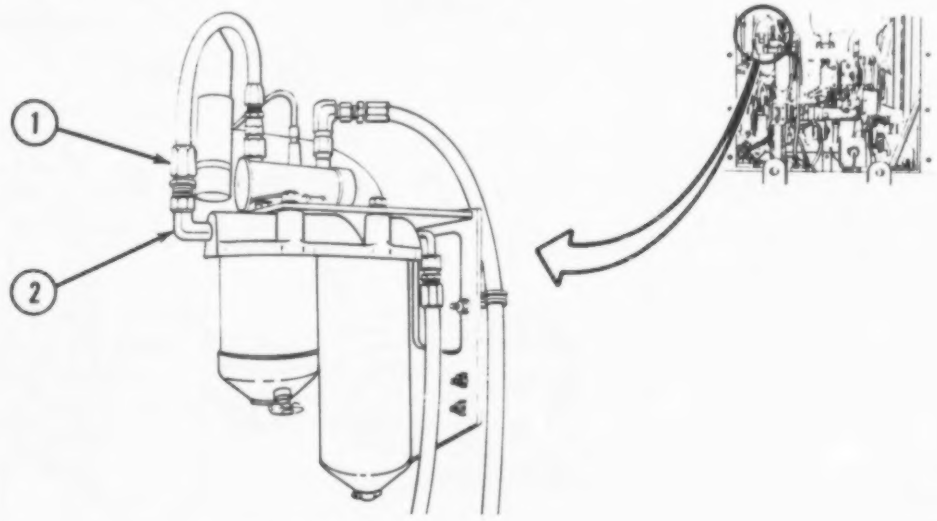
## E. ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

1. DISCONNECT ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY FROM ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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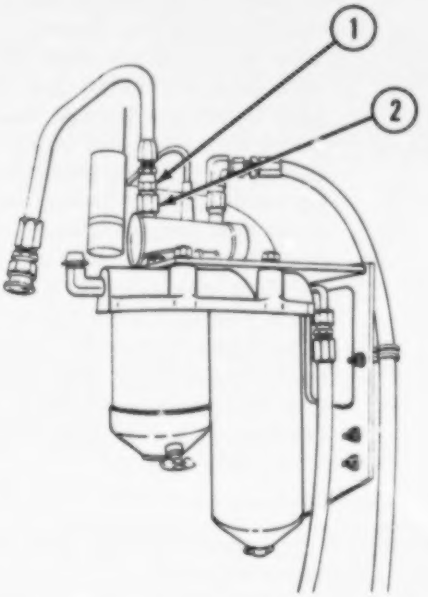
## E. ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY REMOVAL — Continued

2. DISCONNECT ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY FROM ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 11/16 inch and 3/4 inch open end wrenches.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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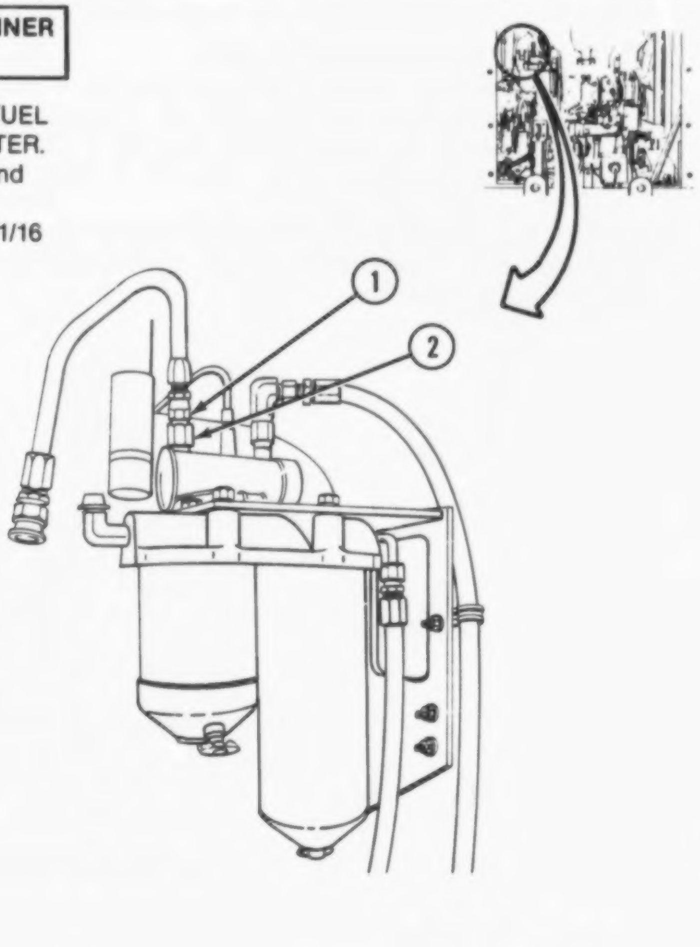
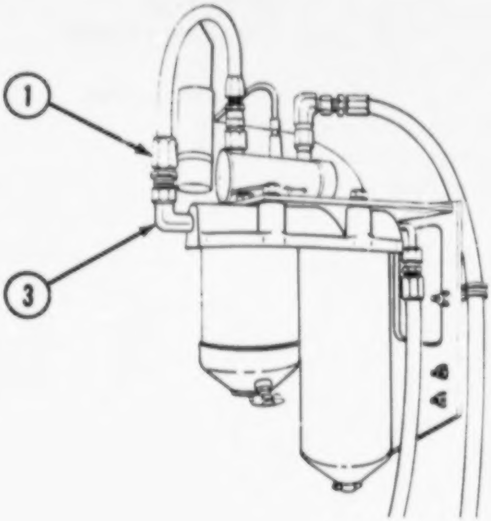
## F. ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY INSTALLATION

1. CONNECT ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY TO ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 11/16 inch open end wrench.



2. CONNECT ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY TO ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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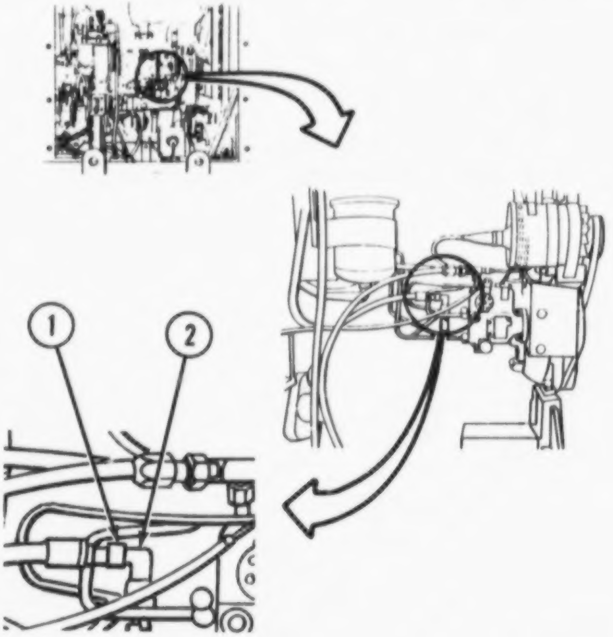
## G. FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

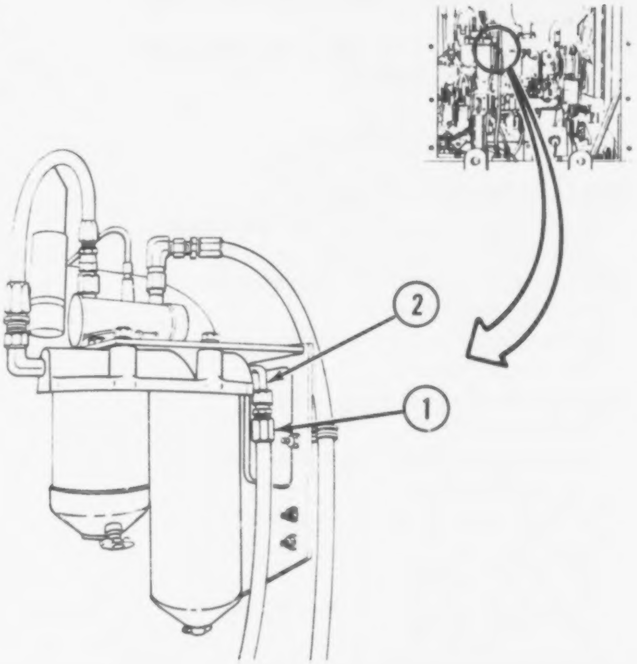


1. DISCONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY FROM FUEL INJECTION PUMP ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.

GO TO NEXT PAGE

## G. FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY REMOVAL — Continued

2. DISCONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY FROM FUEL FILTER ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.
   - Remove hose (1) from dispenser.



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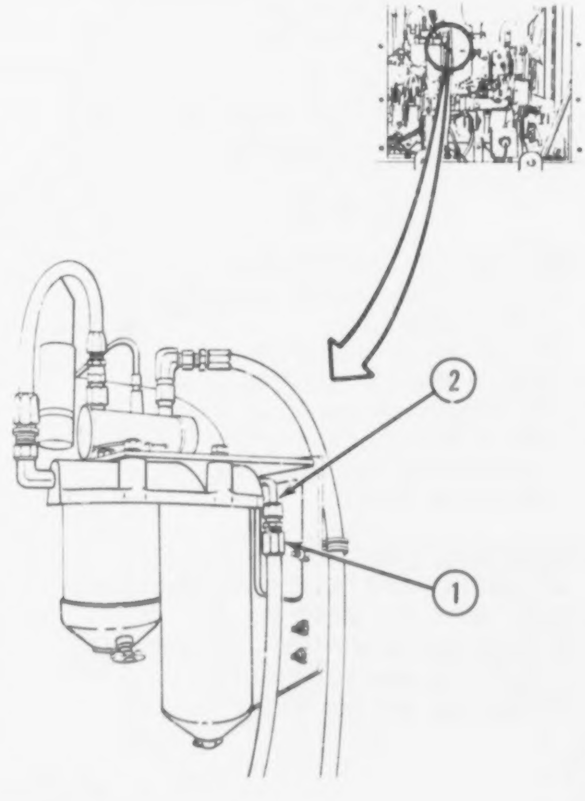
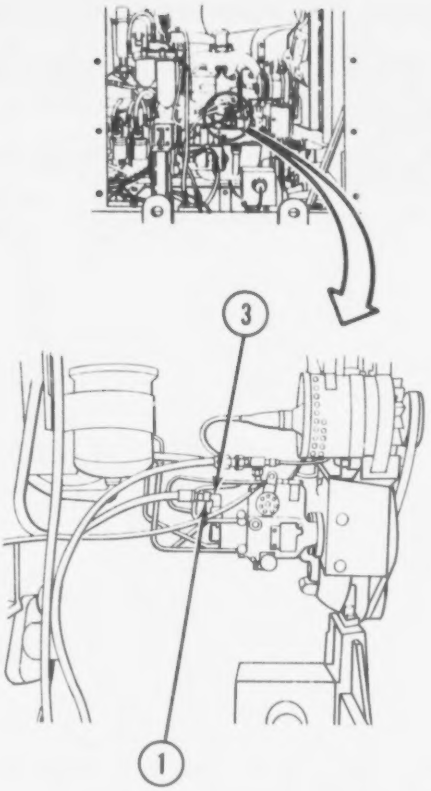
## H. FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY INSTALLATION

1. CONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY TO FUEL FILTER ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 11/16 inch open end wrench.



2. CONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY TO FUEL INJECTION PUMP ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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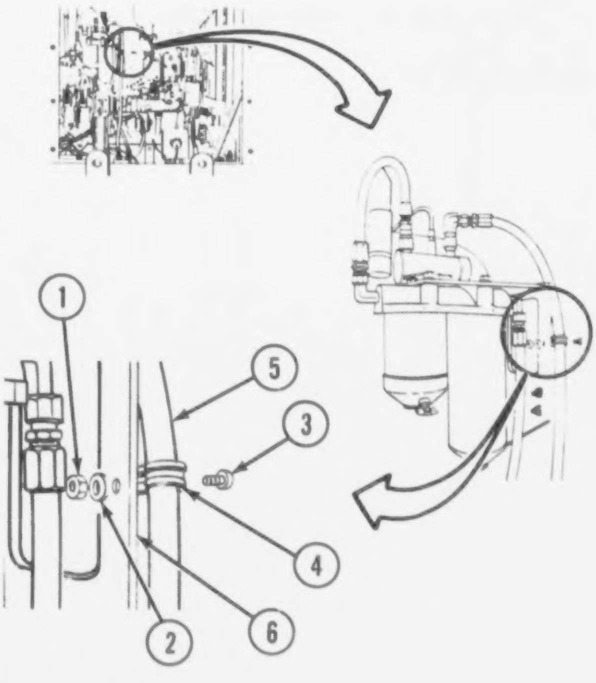
## I. ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)

1. REMOVE HOSE CLAMP FROM ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY.
   - Remove self-locking nut (1), washer (2), screw (3), and hose clamp (4) with hose (5) from fuel filter bracket (6). Use 7/16 inch socket with ratchet handle and 7/16 inch box end wrench. Discard self-locking nut.
   - Remove hose clamp (4) from hose (5).



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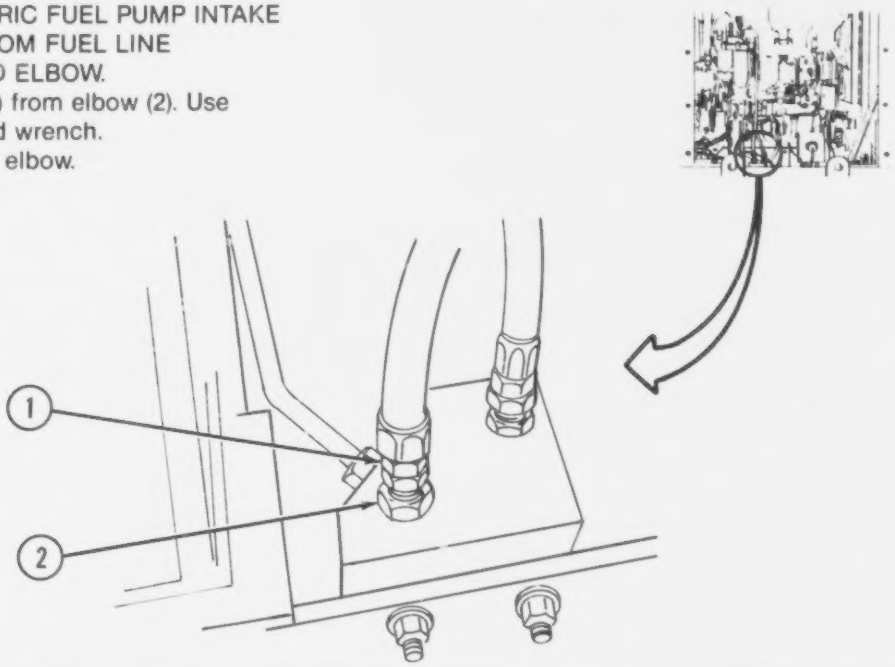
## I. ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY REMOVAL — Continued

2. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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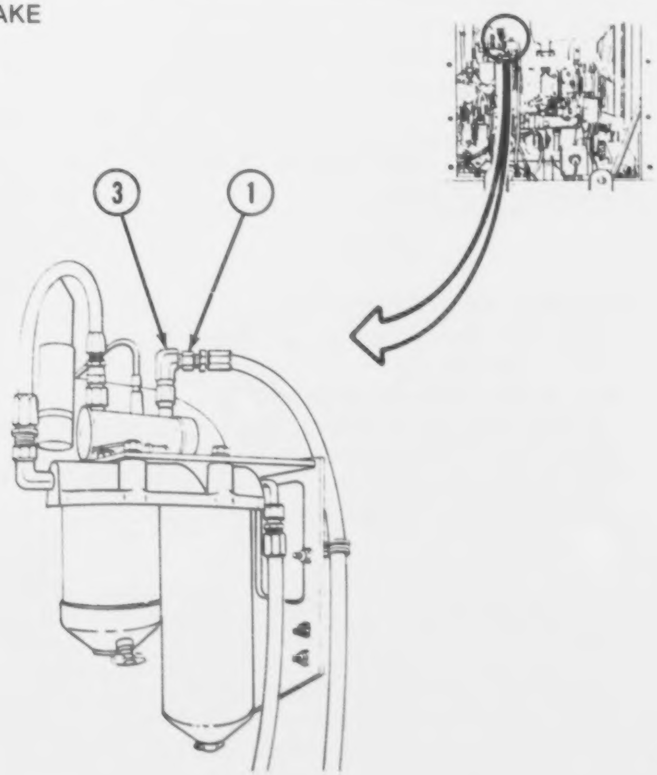
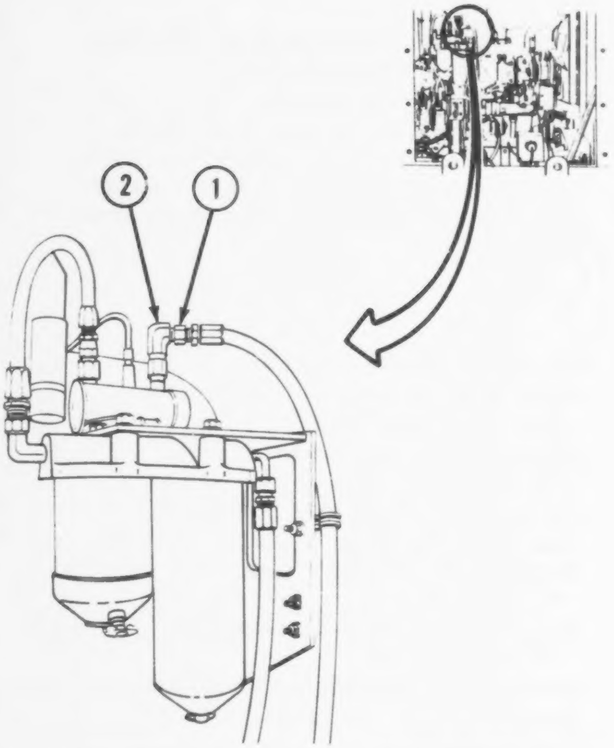
3. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY FROM ELBOW.
   - Disconnect hose (1) from elbow (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.
   - Remove hose (1) from dispenser.



## J. ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY INSTALLATION

1. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY TO ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 11/16 inch open end wrench.



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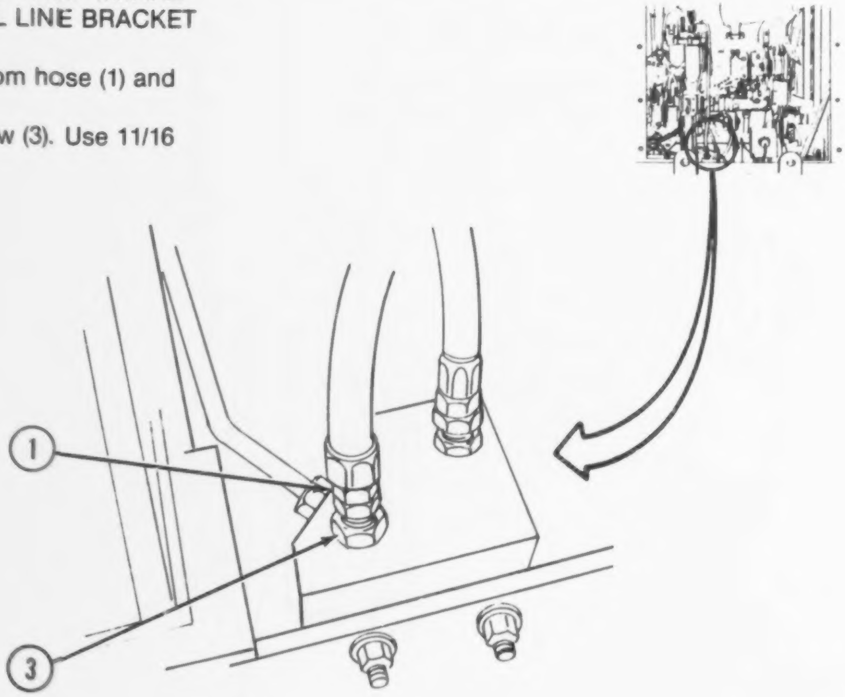
2. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.



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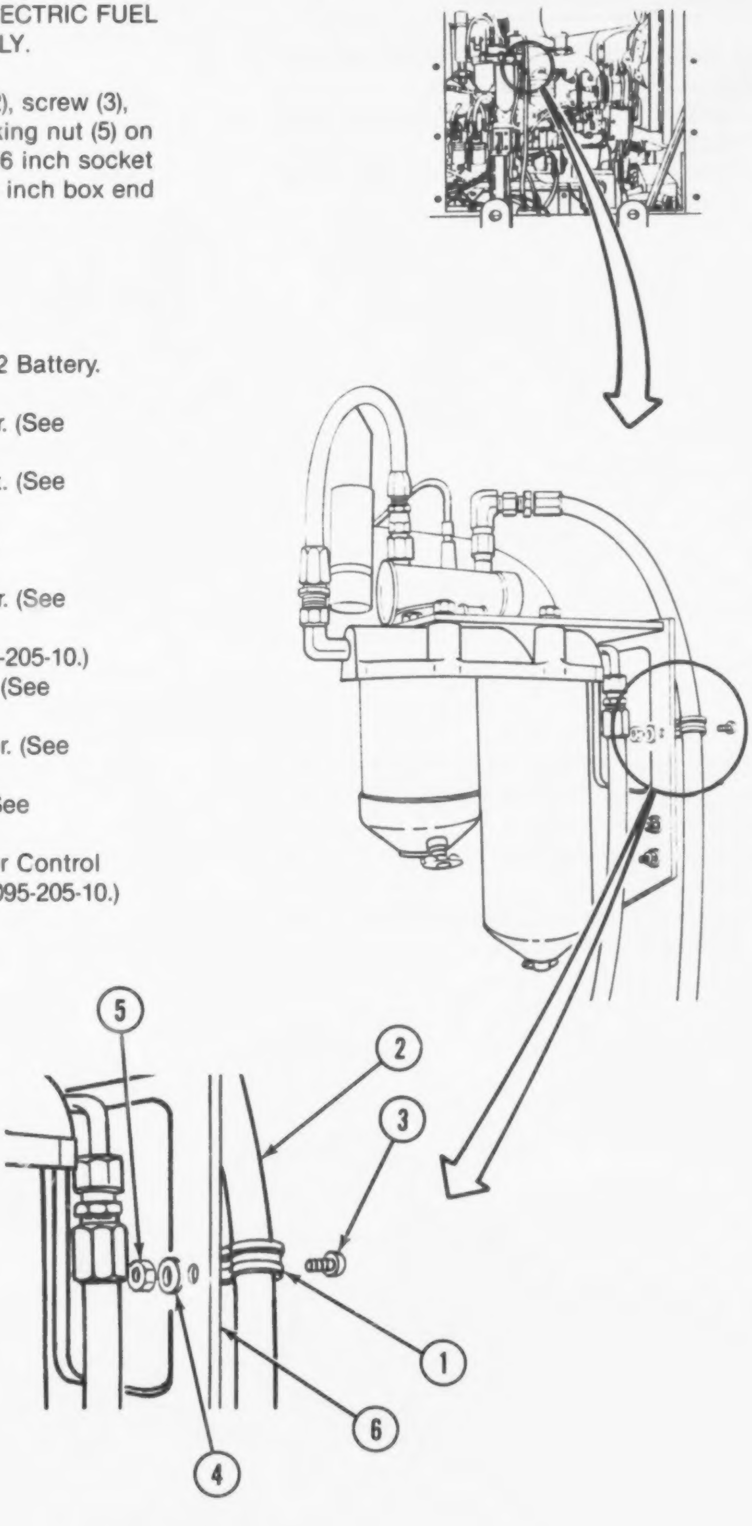
## J. ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY INSTALLATION — Continued

3. INSTALL HOSE CLAMP ON ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY.
   - Place clamp (1) on hose (2).
   - Install clamp (1) with hose (2), screw (3), washer (4), and new self-locking nut (5) on fuel filter bracket (6). Use 7/16 inch socket with ratchet handle and 7/16 inch box end wrench.

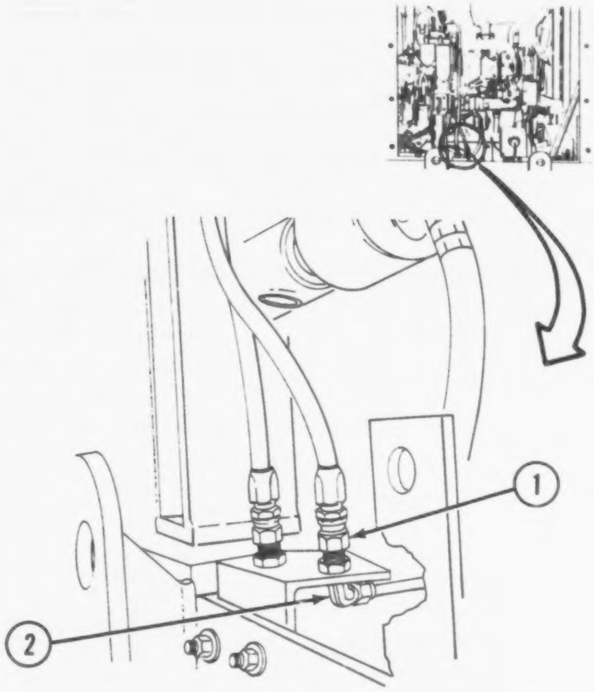
**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)



## K. FUEL INJECTION PUMP RETURN HOSE ASSEMBLY REMOVAL



**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW.
   - Disconnect hose (1) from elbow (2). Use 9/16 inch open end wrench.
   - Plug hose, and cap elbow.

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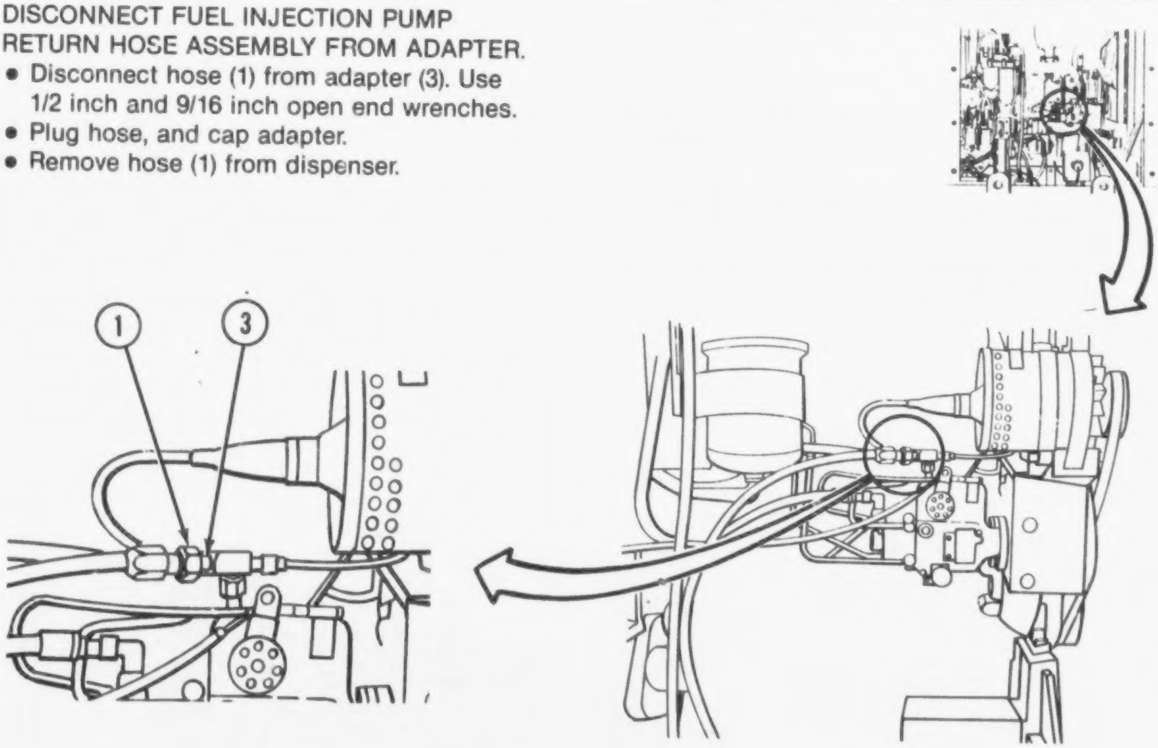
2. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 1/2 inch and 9/16 inch open end wrenches.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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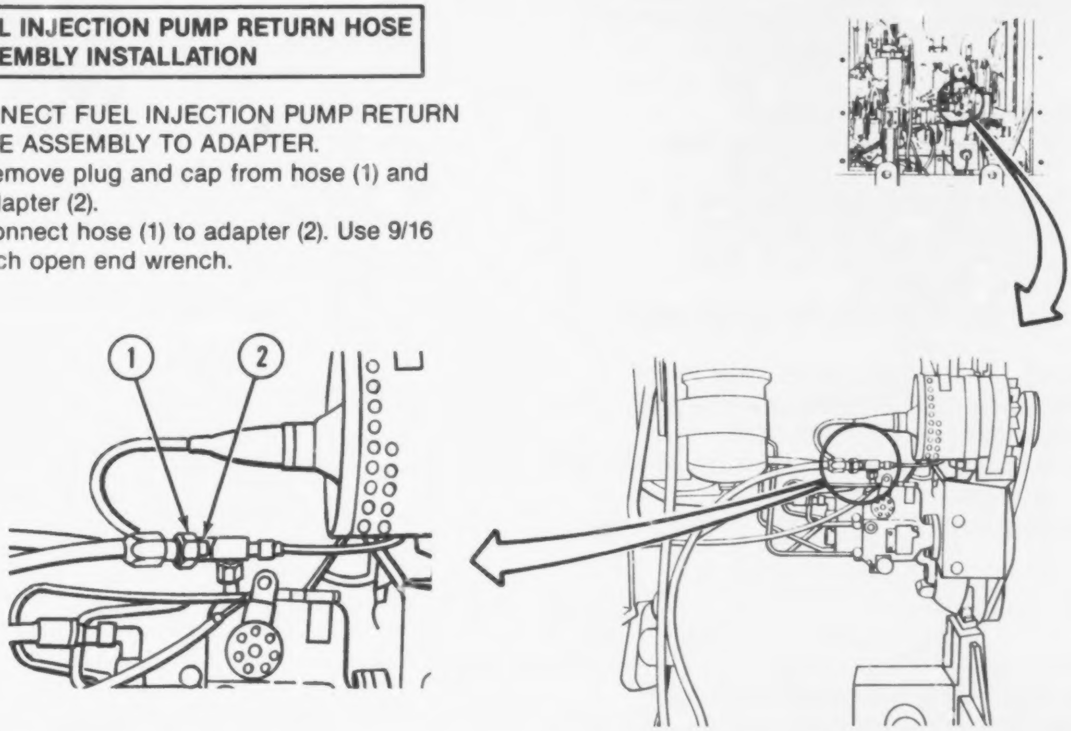
## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET—Continued

### L. FUEL INJECTION PUMP RETURN HOSE ASSEMBLY INSTALLATION

1. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 9/16 inch open end wrench.



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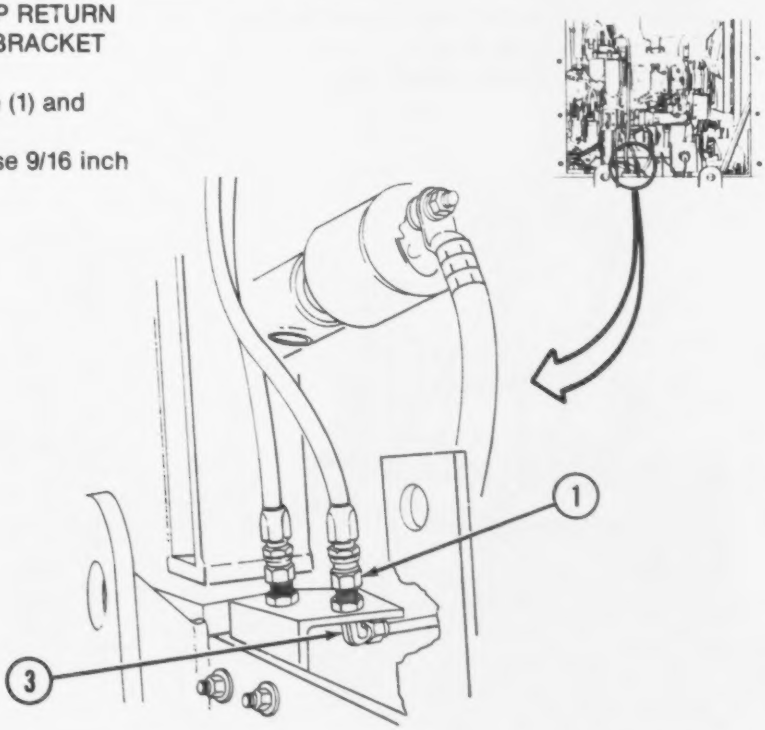
2. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 9/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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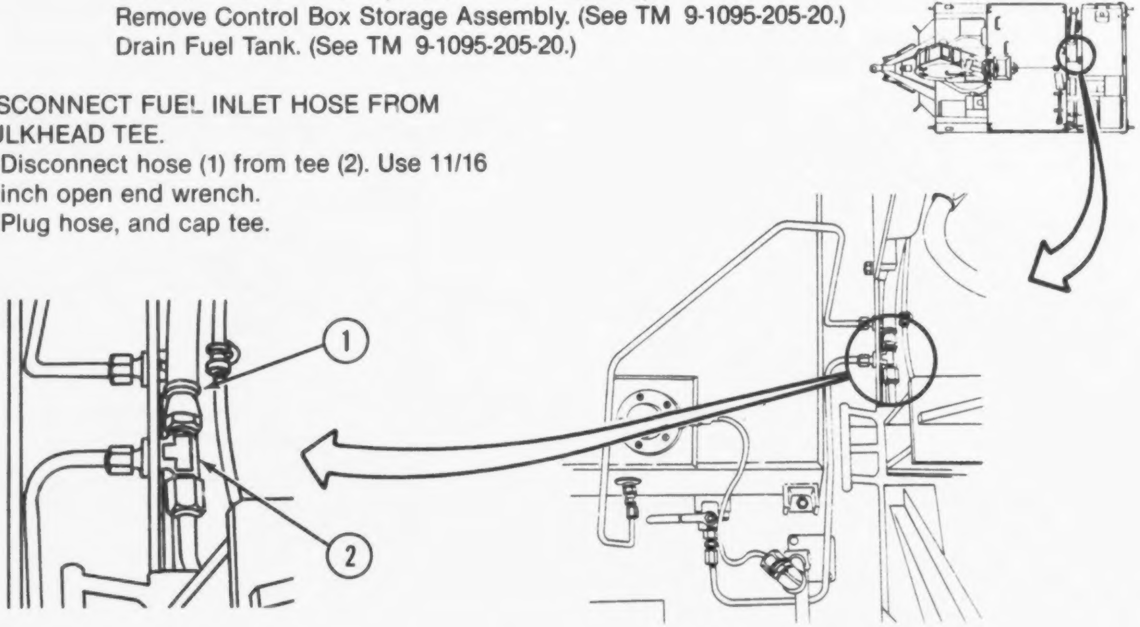
## M. LEFT ENGINE PALLET BULKHEAD ELBOW REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT FUEL INLET HOSE FROM BULKHEAD TEE.
   - Disconnect hose (1) from tee (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.



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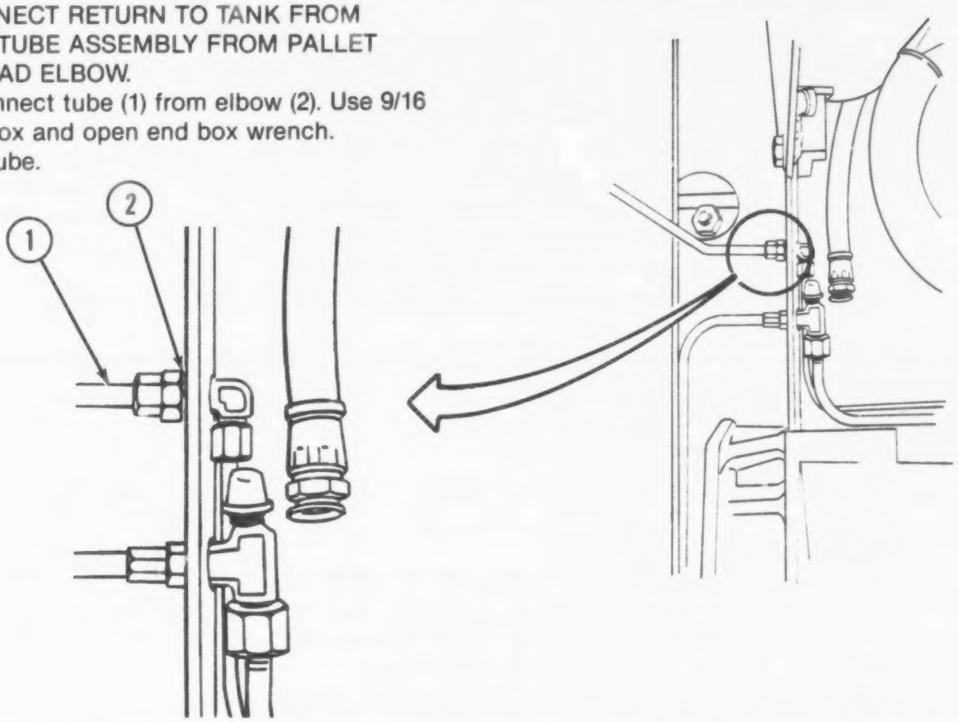
## M. LEFT ENGINE PALLET BULKHEAD ELBOW REMOVAL — Continued

2. DISCONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY FROM PALLET BULKHEAD ELBOW.
   - Disconnect tube (1) from elbow (2). Use 9/16 inch box and open end box wrench.
   - Plug tube.



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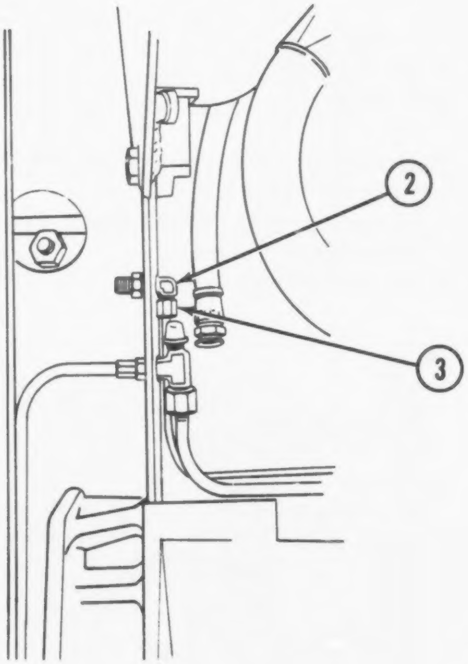
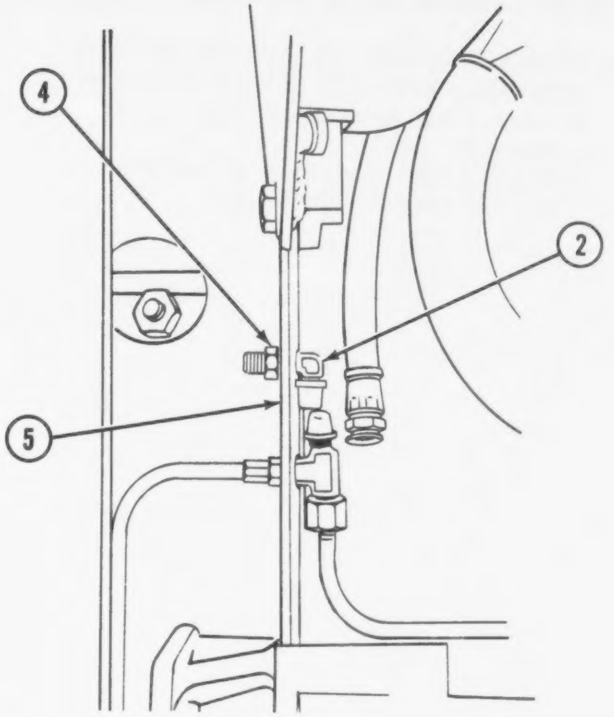
3. REMOVE RETURN TO TANK PALLET TUBE ASSEMBLY FROM PALLET BULKHEAD ELBOW.
   - Disconnect tube (3) from elbow (2). Use 9/16 inch box and open end box wrench.
   - Plug tube, and cap elbow.



4. REMOVE LEFT ENGINE PALLET BULKHEAD ELBOW FROM PALLET.
   - Remove nut (4) and elbow (2) from pallet (5). Use 11/16 inch open end and 6 inch adjustable wrenches.
   - Cap elbow.



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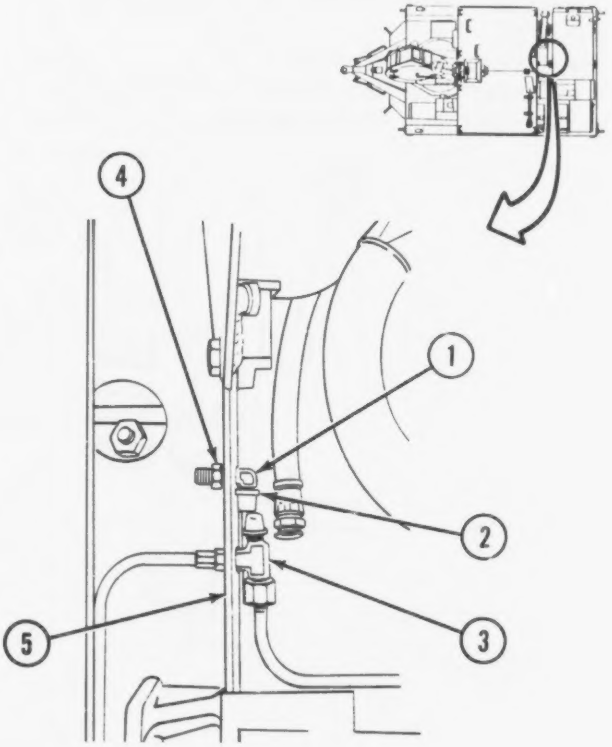
## N. LEFT ENGINE PALLET BULKHEAD ELBOW INSTALLATION

1. INSTALL LEFT ENGINE PALLET BULKHEAD ELBOW ON PALLET.
   - Remove cap from elbow (1).
   - Position elbow (1) with threads (2) towards bulkhead tee (3).
   - Install elbow (1) and nut (4) on pallet (5). Use 11/16 inch open end and 6 inch adjustable wrenches.



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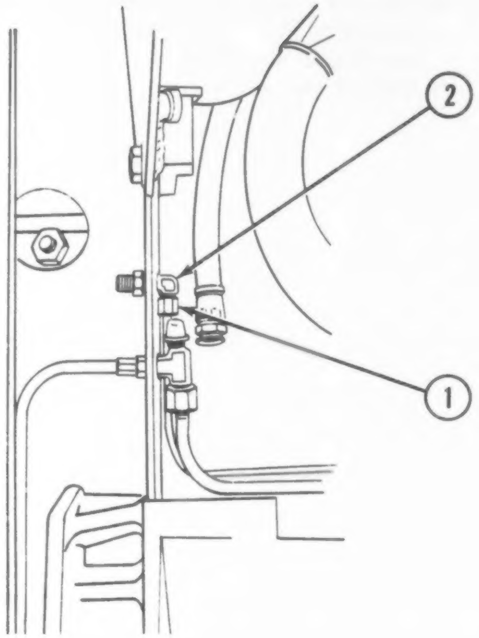
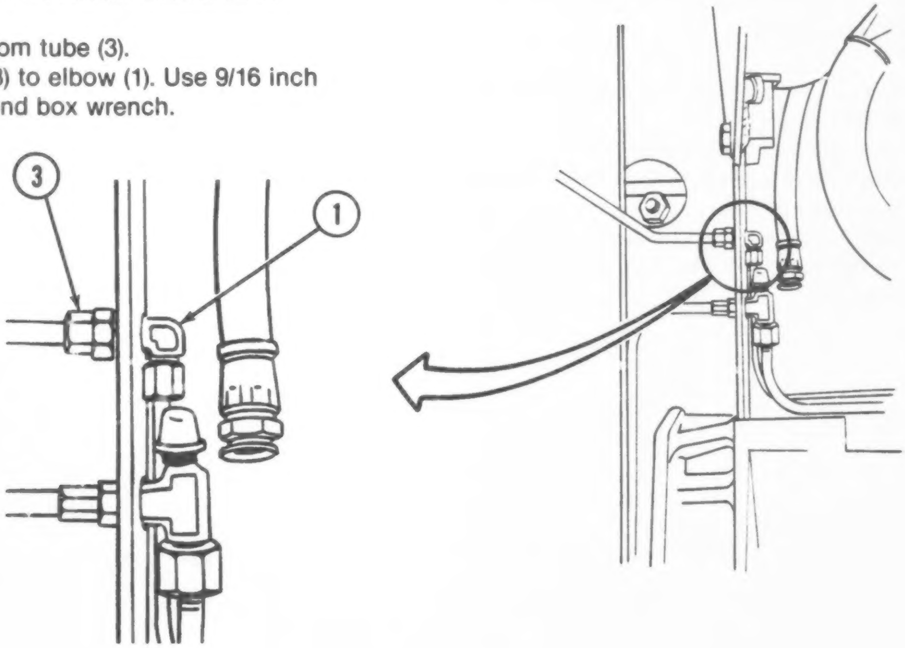
## N. LEFT ENGINE PALLET BULKHEAD ELBOW INSTALLATION — Continued

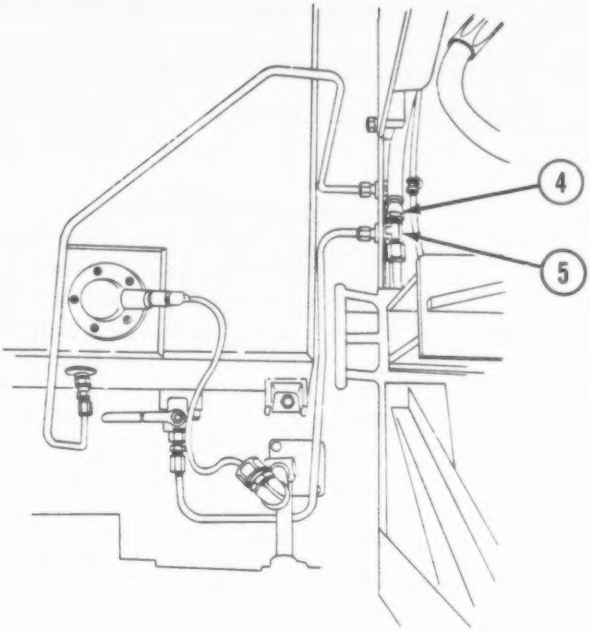
2. CONNECT RETURN TO TANK PALLET TUBE ASSEMBLY TO PALLET BULKHEAD ELBOW.
   - Remove plug and cap from tube (1) and elbow (2).
   - Connect tube (1) to elbow (2). Use 9/16 inch box and open end box wrench.



3. CONNECT RETURN TO TANK FROM PALLET TUBE ASSEMBLY TO PALLET BULKHEAD ELBOW.
   - Remove plug from tube (3).
   - Connect tube (3) to elbow (1). Use 9/16 inch box and open end box wrench.



4. CONNECT FUEL INLET HOSE TO BULKHEAD TEE.
    - Remove plug and cap from hose (4) and tee (5).
    - Connect hose (4) to tee (5). Use 11/16 inch open end wrench.



NOTE

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET—Continued

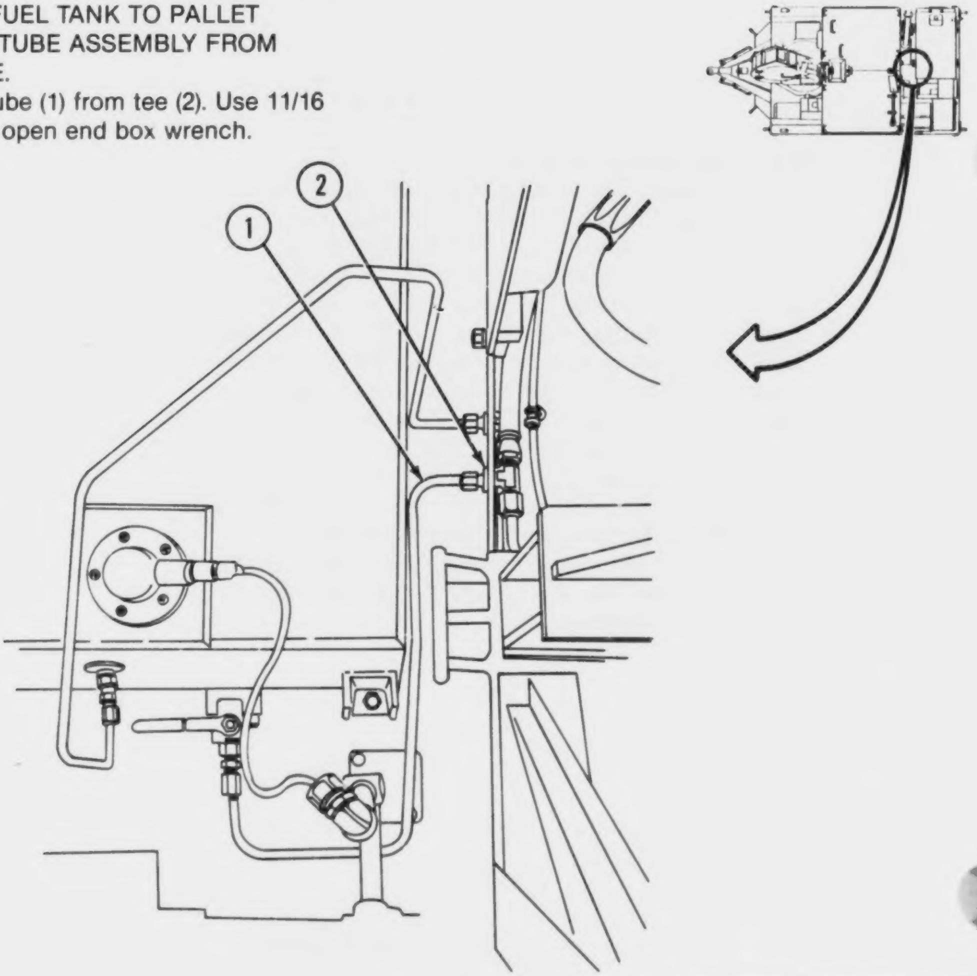
### O. LEFT ENGINE PALLET BULKHEAD TEE REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY FROM BULKHEAD TEE.
   - Disconnect tube (1) from tee (2). Use 11/16 inch box and open end box wrench.
   - Plug tube.



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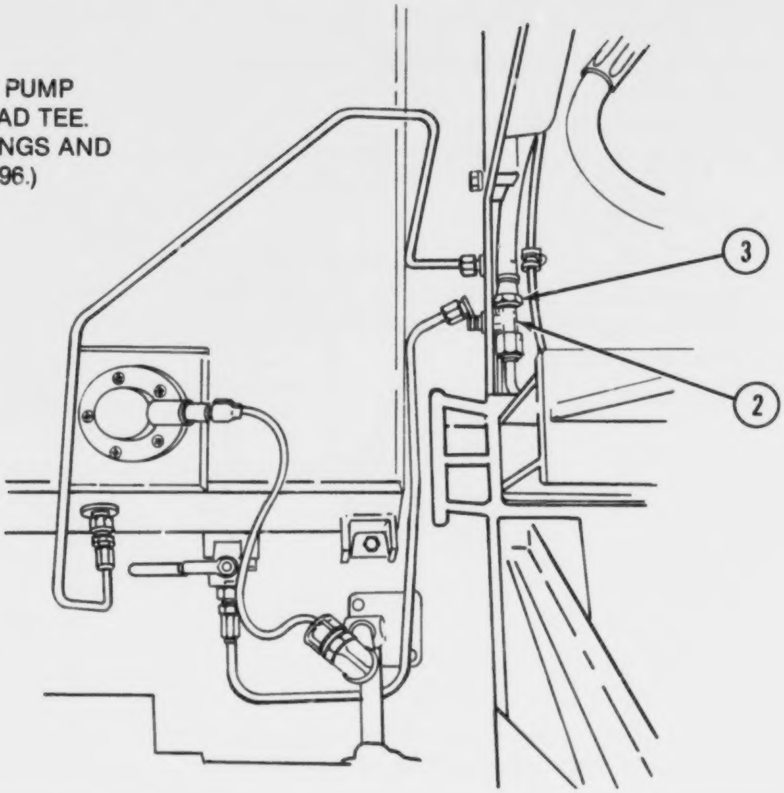
2. DISCONNECT FUEL INLET HOSE FROM BULKHEAD TEE.
   - Disconnect hose (3) from tee (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.

3. DISCONNECT SUCTION TO FUEL PUMP TUBE ASSEMBLY FROM BULKHEAD TEE. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-96.)



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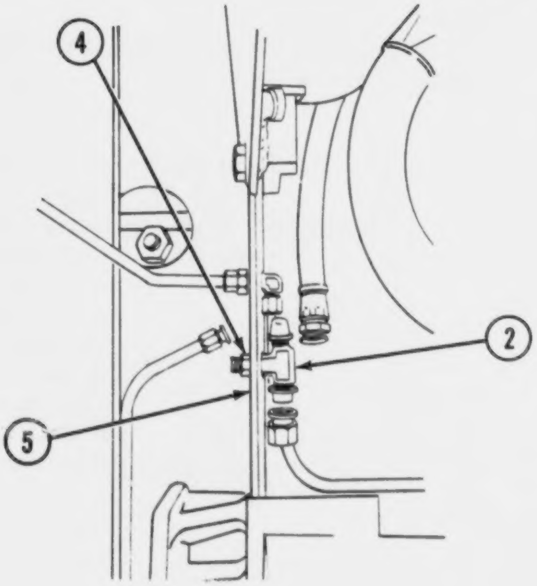
4. REMOVE LEFT ENGINE PALLET BULKHEAD TEE FROM PALLET.
   - Remove nut (4), and bulkhead tee (2) from pallet (5). Use 13/16 inch open end and 6 inch adjustable wrenches.
   - Cap tee.



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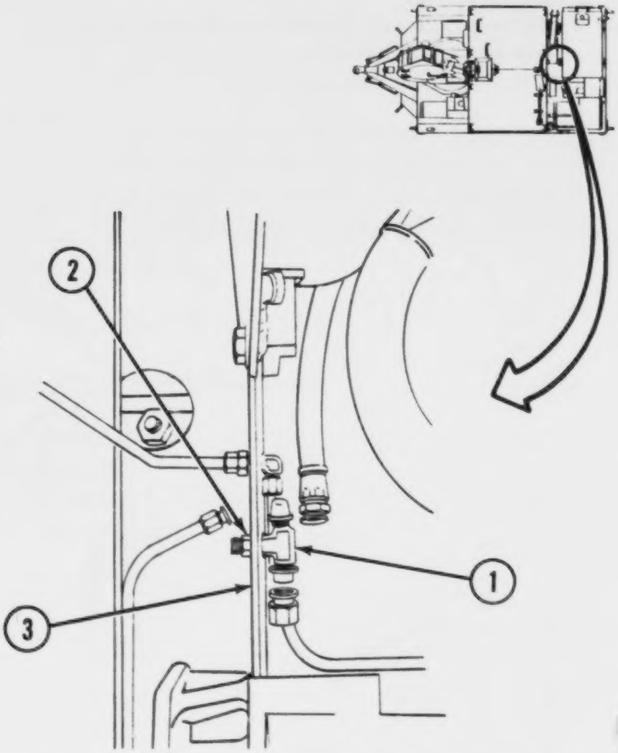
## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET—Continued

### P. LEFT ENGINE PALLET BULKHEAD TEE INSTALLATION

1. INSTALL LEFT ENGINE PALLET BULKHEAD TEE ON PALLET.
   - Remove cap from tee (1).
   - Install tee (1) and nut (2) on pallet (3). Use 13/16 inch open end and 6 inch adjustable wrenches.

2. CONNECT SUCTION TO FUEL PUMP TUBE ASSEMBLY TO BULKHEAD TEE. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-97.)



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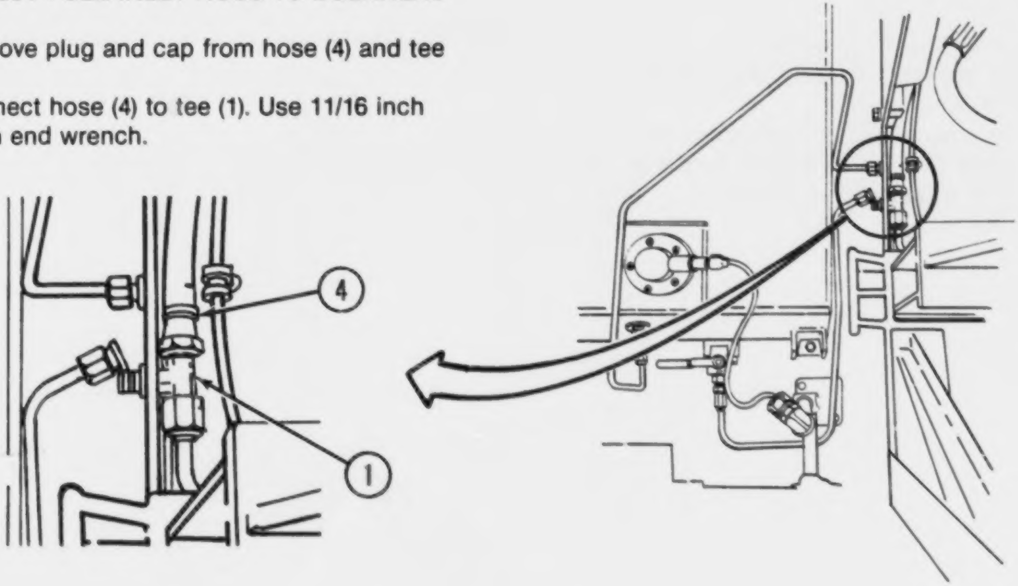
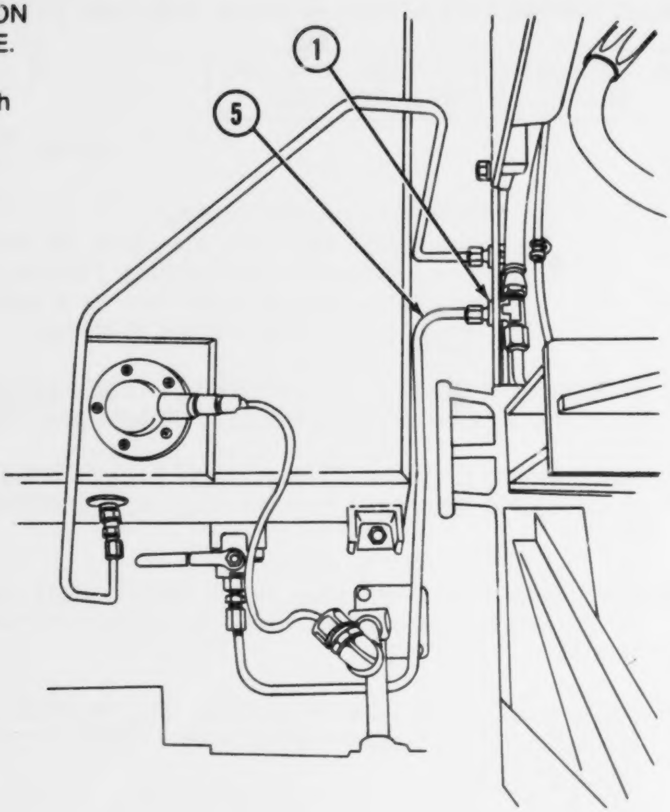
3. CONNECT FUEL INLET HOSE TO BULKHEAD TEE.
   - Remove plug and cap from hose (4) and tee (1).
   - Connect hose (4) to tee (1). Use 11/16 inch open end wrench.



4. CONNECT FUEL TANK TO PALLET SUCTION LINE TUBE ASSEMBLY TO BULKHEAD TEE.
   - Remove plug from tube (5).
   - Connect tube (5) to tee (1). Use 11/16 inch box and open end box wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET—Continued

### Q. RIGHT ENGINE PALLET FUEL LINE BRACKET FITTINGS REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

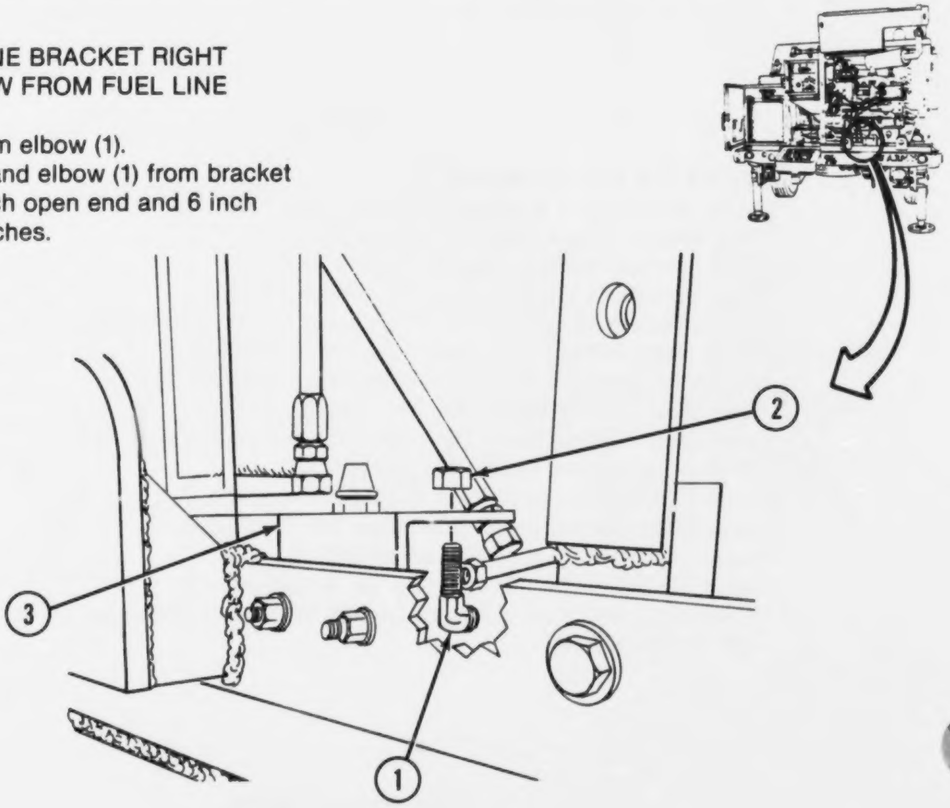
1. DISCONNECT RETURN TO TANK PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-94.)

2. DISCONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-96.)

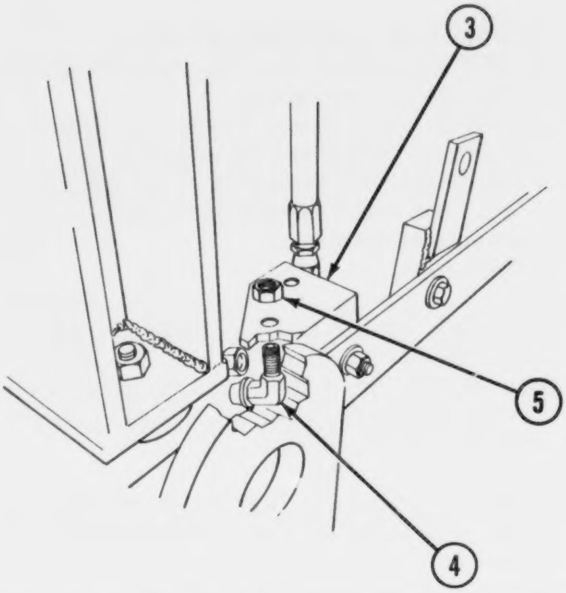
3. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-104.)

4. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-107.)

5. REMOVE FUEL LINE BRACKET RIGHT BULKHEAD ELBOW FROM FUEL LINE BRACKET.
   - Remove cap from elbow (1).
   - Remove nut (2) and elbow (1) from bracket (3). Use 11/16 inch open end and 6 inch adjustable wrenches.
   - Cap elbow.



6. REMOVE FUEL LINE BRACKET LEFT BULKHEAD ELBOW FROM FUEL LINE BRACKET.
    - Remove cap from elbow (4).
    - Remove nut (5) and elbow (4) from bracket (3). Use 13/16 inch open end and 6 inch adjustable wrenches.
    - Cap elbow.



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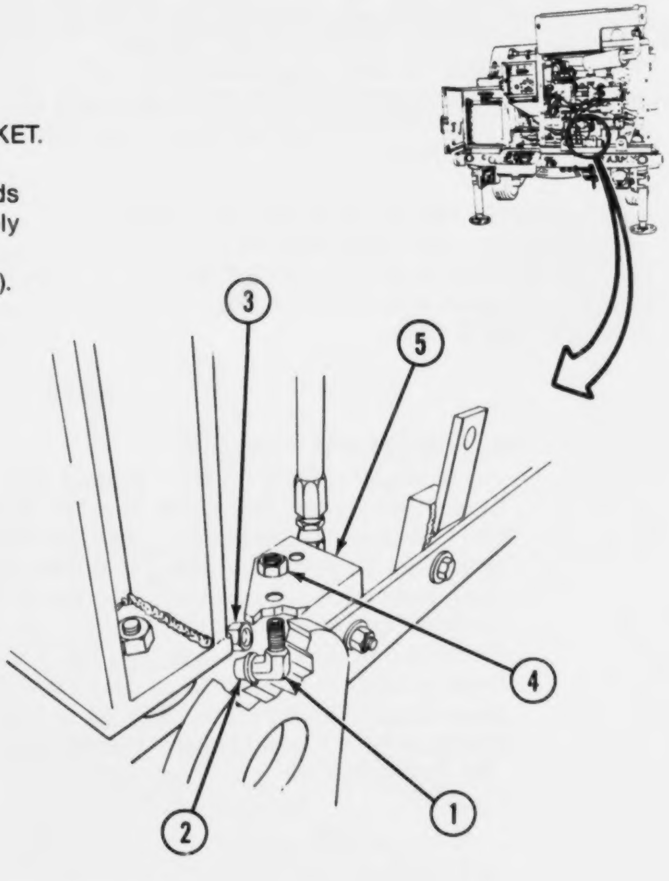
## R. RIGHT ENGINE PALLET FUEL LINE BRACKET FITTINGS INSTALLATION

1. INSTALL FUEL LINE BRACKET LEFT BULKHEAD ELBOW ON FUEL LINE BRACKET.
    - Remove cap from elbow (1).
    - Position elbow (1) with threads (2) towards suction to fuel pump pallet tube assembly (3).
    - Install elbow (1) and nut (4) on bracket (5). Use 13/16 inch open end and 6 inch adjustable wrenches.
    - Cap elbow.



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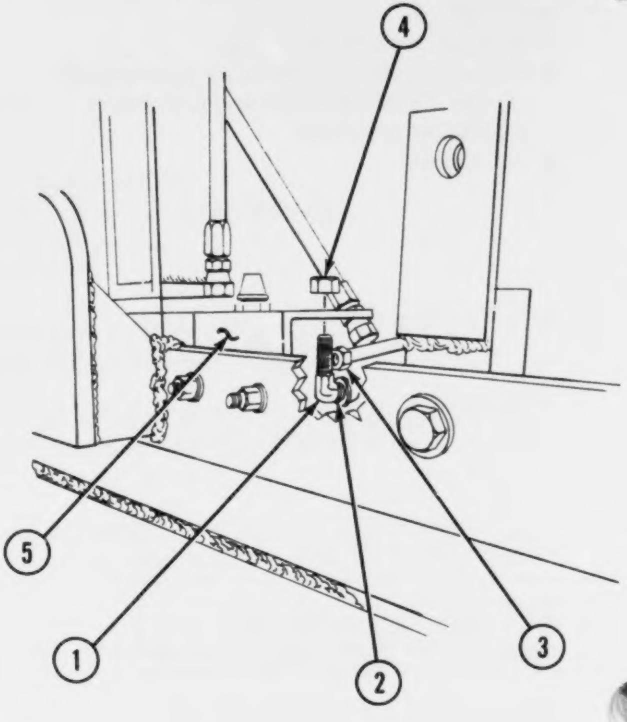
## R. RIGHT ENGINE PALLET FUEL LINE BRACKET FITTINGS INSTALLATION — Continued

2. INSTALL FUEL LINE BRACKET RIGHT BULKHEAD ELBOW ON FUEL LINE BRACKET.
   - Remove cap from elbow (1).
   - Position elbow (1) with threads (2) towards return to tank pallet tube assembly (3).
   - Install elbow (1) and nut (4) on bracket (5). Use 11/16 inch open end and 6 inch adjustable wrenches.
   - Cap elbow.



3. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-108.)

4. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-105.)

5. CONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-98.)

6. CONNECT RETURN TO TANK PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-94.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

## S. RIGHT ENGINE PALLET FUEL LINE BRACKET REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Drain Fuel Tank. (See TM 9-1095-205-20.)

1. DISCONNECT RETURN TO TANK PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-94.)

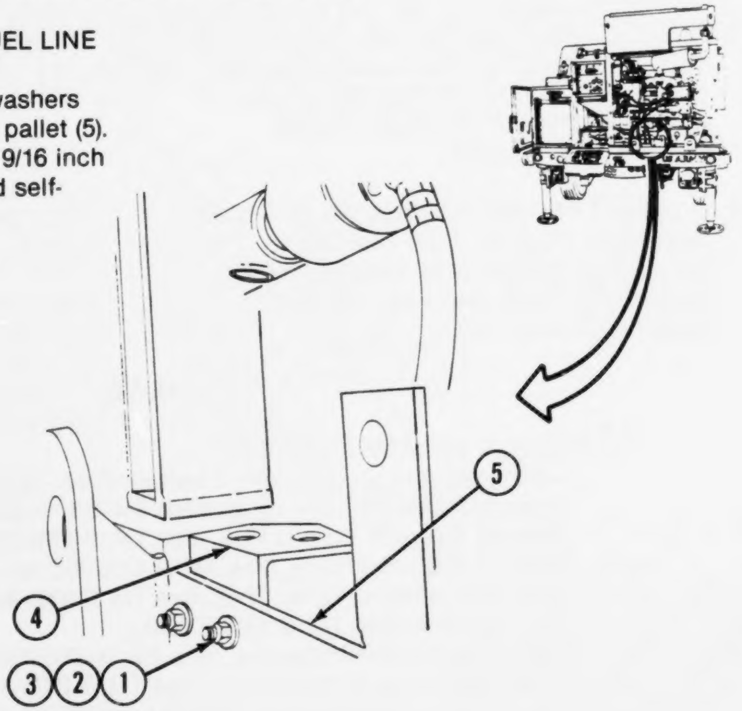
2. DISCONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-96.)

3. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-104.)

4. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-107.)

5. REMOVE RIGHT ENGINE PALLET FUEL LINE BRACKET FITTINGS FROM DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-118.)

6. REMOVE RIGHT ENGINE PALLET FUEL LINE BRACKET FROM PALLET.
   - Remove two self-locking nuts (1), washers (2), screws (3), and bracket (4) from pallet (5). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle. Discard self-locking nuts.



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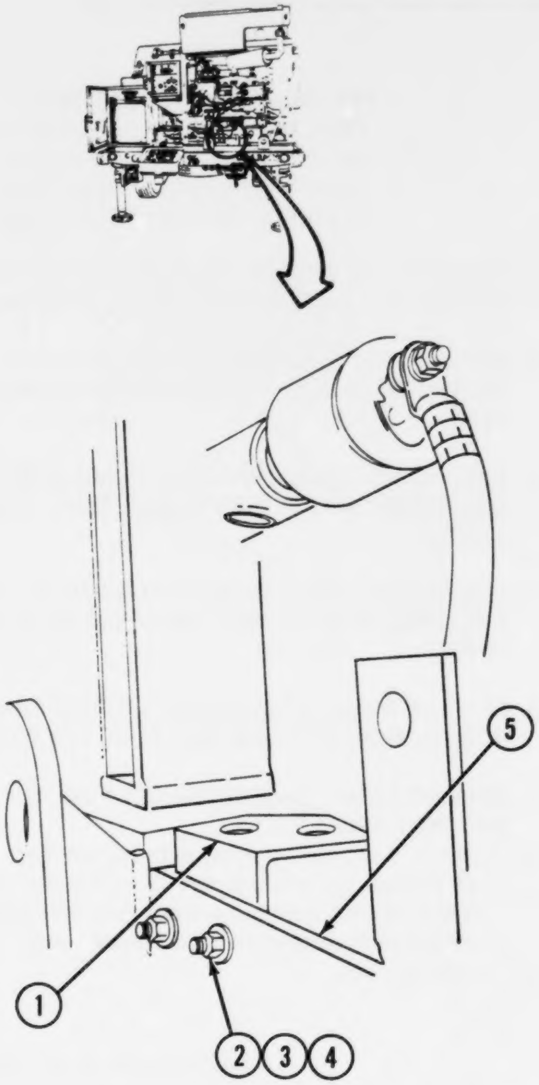
## 15-12 ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET—Continued

### T. RIGHT ENGINE PALLET FUEL LINE BRACKET INSTALLATION

1. INSTALL RIGHT ENGINE PALLET FUEL LINE BRACKET ON PALLET.
   - Install bracket (1), two screws (2), washers (3), and new self-locking nuts (4) on pallet (5). Use 9/16 inch open end wrench and 9/16 inch socket with ratchet handle.
2. INSTALL RIGHT ENGINE PALLET FUEL LINE BRACKET FITTINGS ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-119.)
3. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE PAGE 15-108.)
4. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-105.)
5. CONNECT SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-98.)
6. CONNECT RETURN TO TANK PALLET TUBE ASSEMBLY TO FUEL LINE BRACKET BULKHEAD ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-94.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

## U. FUEL FILTER BRACKET REMOVAL

### NOTE

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fuel Filter Element And Strainer. (See TM 9-1095-205-20.)
Remove Fuel Filter And Strainer Head. (See TM 9-1095-205-20.)
Disconnect Oil Pressure Hose. (See TM 9-1095-205-20.)
Disconnect Oil Return Hose. (See TM 9-1095-205-20.)
Remove Oil Filter Assembly. (See TM 9-1095-205-20.)
Remove Ether Fuel Cylinder And Clamp Bracket. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)
Remove Air Filter Service Air Indicator System. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)
Remove Cold Start Assembly. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)

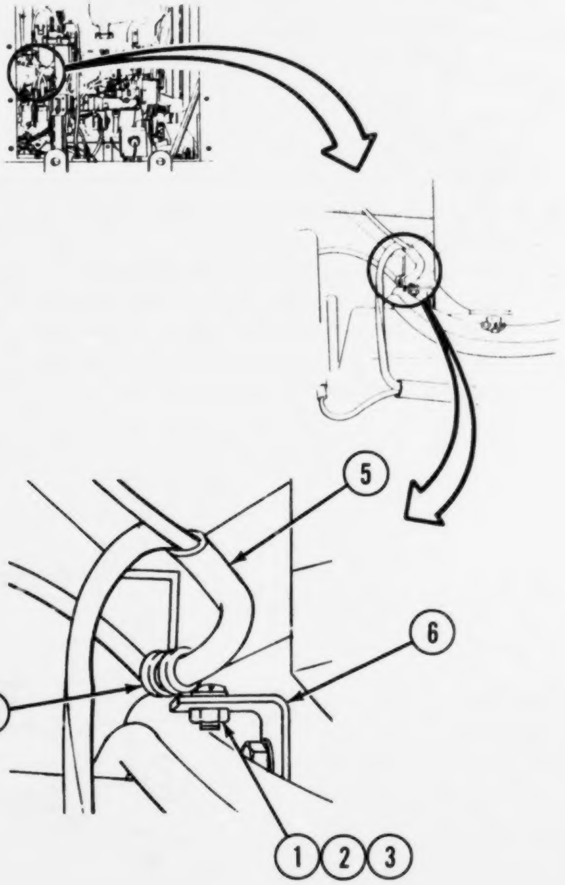
1. REMOVE ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY FROM DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-99.)

2. DISCONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY FROM FUEL FILTER ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-102.)

3. REMOVE HOSE CLAMP FROM ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-103.)

4. REMOVE ELECTRIC FUEL TRANSFER PUMP FROM DISPENSER. (SEE TM 9-1095-205-20.)

5. REMOVE CLAMP WITH ENGINE WIRING HARNESS FROM WIRING HARNESS RIGHT BRACKET.
   - Remove self-locking nut (1), screw (2), washer (3), and clamp (4) with wiring harness (5) from harness right bracket (6). Use 3/8 inch box end wrench and No. 2 offset cross tip screwdriver. Discard self-locking nut.



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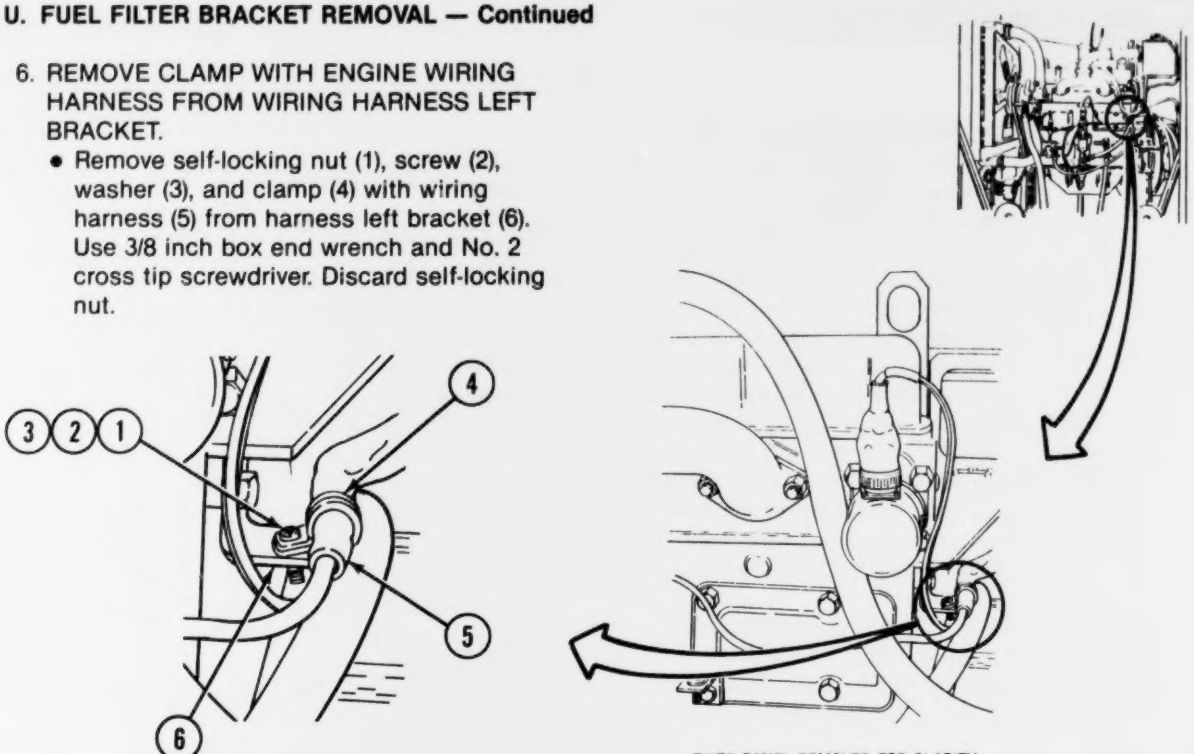
## U. FUEL FILTER BRACKET REMOVAL — Continued

6. REMOVE CLAMP WITH ENGINE WIRING HARNESS FROM WIRING HARNESS LEFT BRACKET.
   - Remove self-locking nut (1), screw (2), washer (3), and clamp (4) with wiring harness (5) from harness left bracket (6). Use 3/8 inch box end wrench and No. 2 cross tip screwdriver. Discard self-locking nut.



FIXED PANEL REMOVED FOR CLARITY

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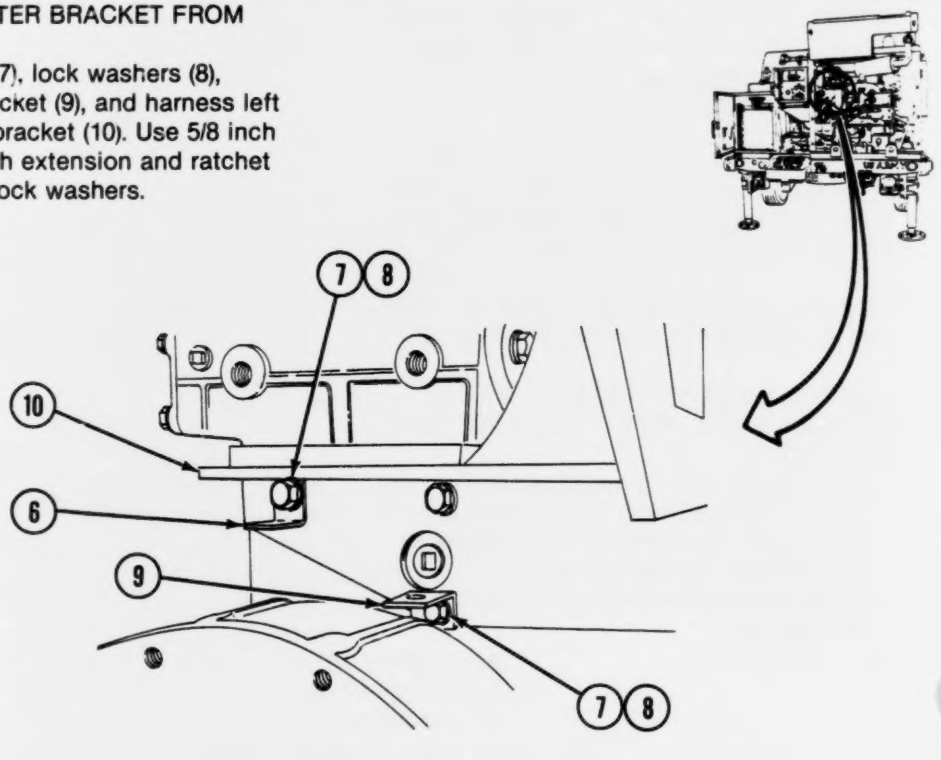
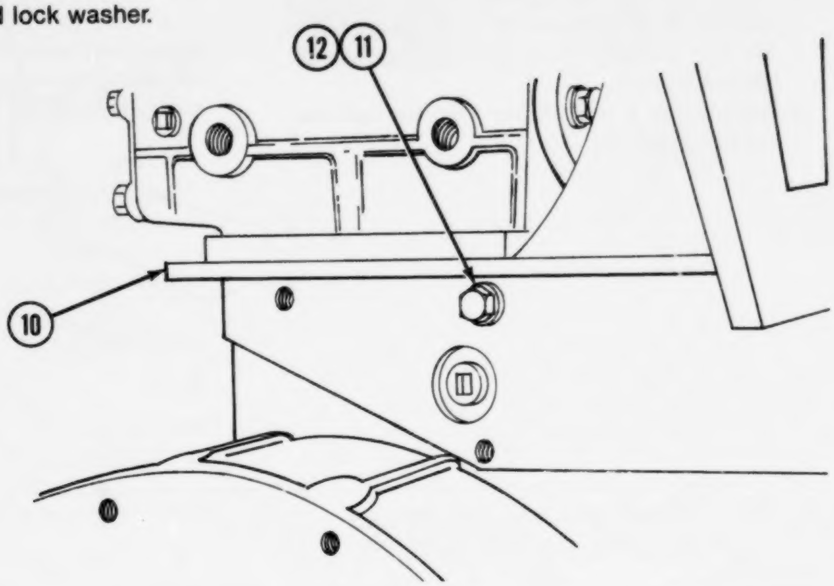
7. REMOVE FUEL FILTER BRACKET FROM ENGINE.
   - Remove screws (7), lock washers (8), harness right bracket (9), and harness left bracket (6) from bracket (10). Use 5/8 inch socket with 5 inch extension and ratchet handle. Discard lock washers.



- Remove screw (11), lock washer (12), and bracket (10) from engine. Use 5/8 inch socket with 5 inch extension and ratchet handle. Use helper. Discard lock washer.



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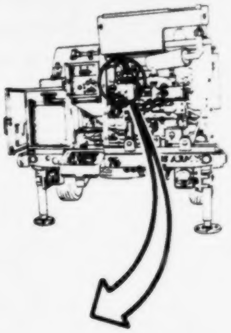
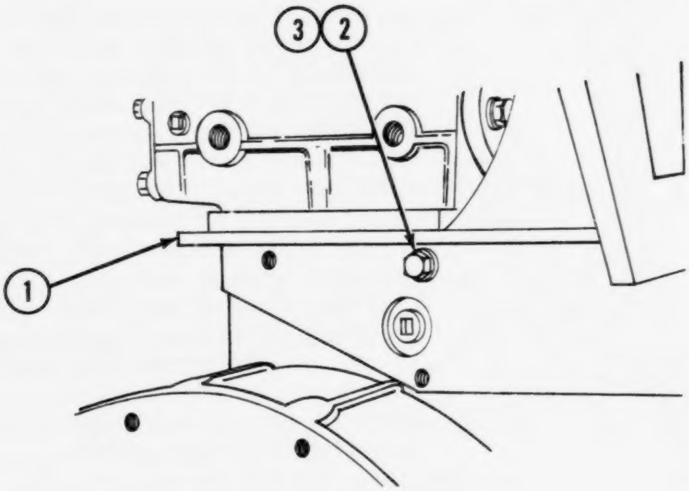
## V. FUEL FILTER BRACKET INSTALLATION

1. INSTALL FUEL FILTER BRACKET ON ENGINE.
   - Position bracket (1) on engine with mounting holes alined. Use helper.
   - Install bracket (1), new lock washer (2), and screw (3) on engine. Use 5/8 inch socket with 5 inch extension and ratchet handle.





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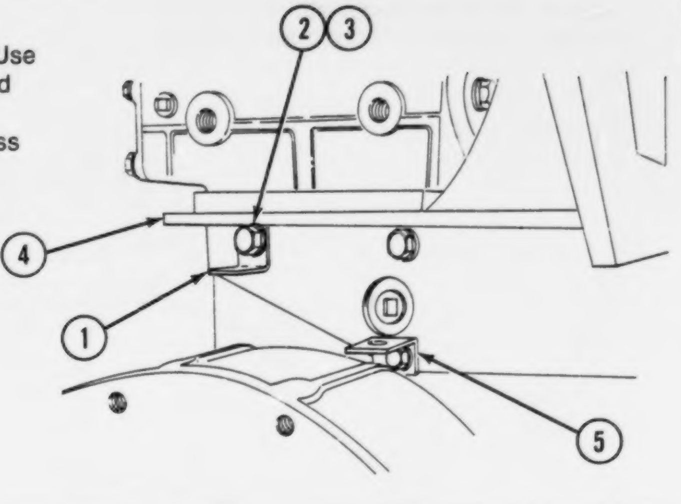
## V. FUEL FILTER BRACKET INSTALLATION — Continued

- Install harness left bracket (1), new lock washer (2), and screw (3) on bracket (4). Use 5/8 inch socket with 5 inch extension and ratchet handle.
- Repeat above installation step for harness right bracket (5).



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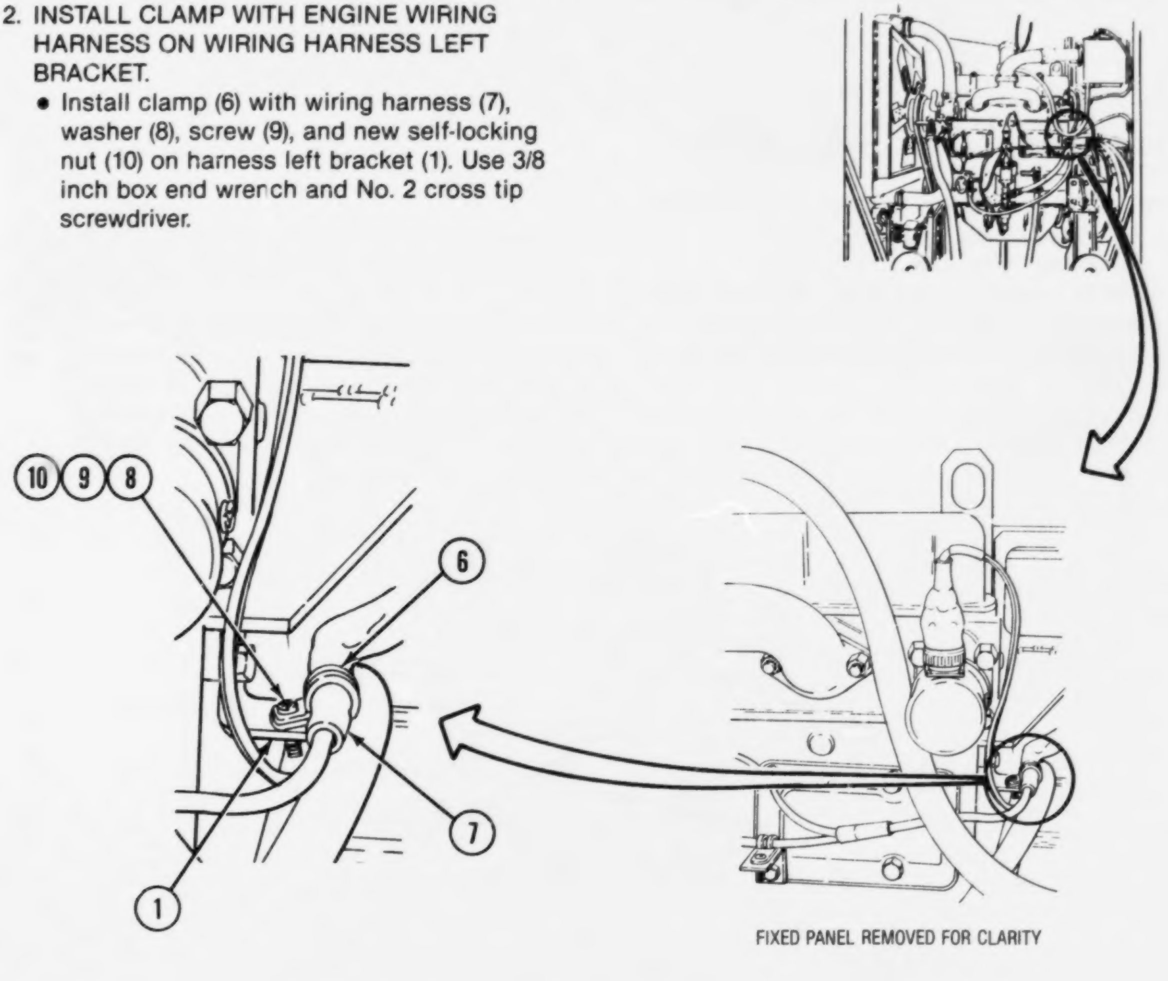
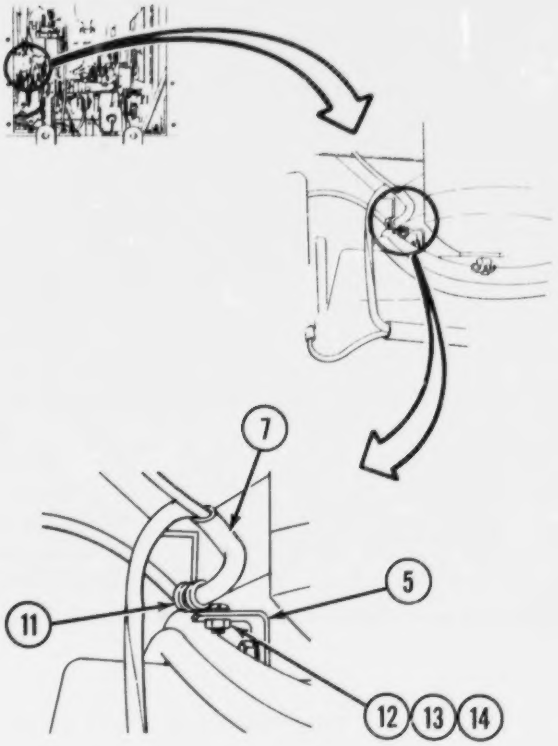
2. INSTALL CLAMP WITH ENGINE WIRING HARNESS ON WIRING HARNESS LEFT BRACKET.
   - Install clamp (6) with wiring harness (7), washer (8), screw (9), and new self-locking nut (10) on harness left bracket (1). Use 3/8 inch box end wrench and No. 2 cross tip screwdriver.



FIXED PANEL REMOVED FOR CLARITY

3. INSTALL CLAMP WITH ENGINE WIRING HARNESS ON WIRING HARNESS RIGHT BRACKET.
   - Install clamp (11) with wiring harness (7), washer (12), screw (13), and new self-locking nut (14) on harness right bracket (5). Use 3/8 inch box end wrench and No. 2 offset cross tip screwdriver.
4. INSTALL ELECTRIC FUEL TRANSFER PUMP ON DISPENSER. (SEE TM 9-1095-205-20.)
5. INSTALL HOSE CLAMP ON ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-106.)
6. CONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY TO FUEL FILTER ELBOW. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-102.)
7. INSTALL ELECTRIC FUEL PUMP TO FUEL STRAINER HOSE ASSEMBLY ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS AND FUEL FILTER BRACKET, PAGE 15-100.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Cold Start Assembly. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)
Install Air Filter Service Air Indicator System. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)
Install Ether Fuel Cylinder And Clamp Bracket. (See Cold Start Assembly and Air Filter Service Air Indicator System, Page 15-3.)
Install Oil Filter Assembly. (See TM 9-1095-205-20.)
Connect Oil Return Hose. (See TM 9-1095-205-20.)
Connect Oil Pressure Hose. (See TM 9-1095-205-20.)
Install Fuel Filter And Strainer Head. (See TM 9-1095-205-20.)
Install Fuel Filter Element And Strainer. (See TM 9-1095-205-20.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Connect Operator Control Box. (See TM 9-1095-205-10.)
Open Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Fill Fuel Tank. (See TM 9-1095-205-10.)
Place Fuel System In Service. (See TM 9-1095-205-20.)
Close Main Control Panel Door. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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END OF TASK

## 15-13 STARTER

**DESCRIPTION**

This task covers:
A. STARTER TEST (p 15-130)
B. SOLENOID SWITCH REMOVAL (p 15-131)
C. SOLENOID SWITCH INSTALLATION (p 15-132)
D. SOLENOID SWITCH DISASSEMBLY (p 15-133)
E. SOLENOID SWITCH REASSEMBLY (p 15-134)
F. BRUSH REMOVAL (p 15-137)
G. BRUSH INSTALLATION (p 15-139)
H. MOTOR DRIVE-CLUTCH REMOVAL (p 15-141)
I. MOTOR DRIVE-CLUTCH INSTALLATION (p 15-143)
J. ARMATURE REMOVAL (p 15-146)
K. ARMATURE INSTALLATION (p 15-149)
L. LEVER HOUSING REMOVAL (p 15-150)
M. LEVER HOUSING INSTALLATION (p 15-152)
N. FIELD COIL ASSEMBLY REMOVAL (p 15-155)
O. FIELD COIL ASSEMBLY INSTALLATION (p 15-158)

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**INITIAL SETUP**

***Tools and Special Tools:***

General mechanic's tool kit 5180-00-177-7033:
  Ratchet handle
  3/8 inch socket
  7/16 inch socket
  5/8 inch socket
  1/4 inch flat tip screwdriver
  No. 2 cross tip screwdriver
  No. 3 cross tip screwdriver
  3/16 inch hex key
  1/2 inch box end wrench
  Center punch
  1/4 inch pin punch
  Cold chisel
  Ball peen hammer
  Slip joint pliers (2)
  6 inch steel rule
AN/URM Multimeter 6625-00-999-6282
Hacksaw blade 5110-00-243-0901
Soft faced hammer 5120-00-903-8553
Hand arbor press 3444-00-243-2654
Dial indicating depth gage 5310-00-710-4359
Vernier caliper 5210-00-293-2913
Suitable container
1/2 inch crowfoot attachment 5120-00-184-8384

***Tools and Special Tools — Continued:***

Machinist's scriber 5120-00-221-7063
Retaining ring pliers 5120-00-595-9551
1/4 inch drive ratchet handle 5120-00-221-7957
1/2 inch pipe coupling 4730-00-187-7612
Rivet installing tool
1/4 inch drive 5/16 inch socket 5120-00-235-5878
Wrench pliers 5120-00-277-4244
Test stand auto generator/starter 4910-01-041-8161
Goggles 4140-00-269-7912
Air compressor 4310-00-542-4566
Blow gun 4940-00-333-5544
3/8 inch drive torque wrench 5120-00-541-3001
3/8 inch to 1/2 inch socket wrench adapter 5120-00-240-8702

***Materials/Parts:***

Lock washer 5310-00-476-7648
Lock washer 5310-00-373-0373
Lock washer (2) 5130-00-045-3467
Screw and captive washer (4) 5305-00-900-8496
Retaining ring 5365-00-715-1152
Retaining ring 5340-00-793-3265

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**INITIAL SETUP — Continued**

***Materials/Parts — Continued:***
Expansion plug (2) 5340-00-428-0745
Rivets (2)
Retaining ring 5365-00-804-9666
Expansion plug (2) 5340-00-934-0085
Gasket 5330-00-061-8358
Dowel pin 5315-00-247-5448
Insulating varnish, Item 13, Appendix B
Flint abrasive paper, Item 8, Appendix B
Lubricating oil, Item 16, Appendix B

***Materials/Parts — Continued:***
Crocus cloth, Item 4, Appendix B
Rags, Item 22, Appendix B

***Personnel Required:***
Electrical repairer
Helper

***References:***
TM 5-6115-464-34
TM 9-4910-663-12

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## OVERVIEW

Perform A. Starter Test (page 15-130) before working on starter. Starter Test consists of solenoid assembly test, no load test, and starter problems diagnosis. In starter problems diagnosis, you compare your test results with normal results given in step 3. Diagnose Starter Problems (page 15-130). Then go to Starter Diagnostic Chart (page 15-131) if your results are not normal. In this chart, problem causes are listed in order of most likely occurrence, followed by repair action. Once you complete a repair action, you must repeat A. Starter Test (page 15-130) to ensure there are no problems.

For complete disassembly of starter, do subparagraphs B thru O in order (see pages 15-131 thru 15-159).

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## A. STARTER TEST

1. TEST STARTER SOLENOID ASSEMBLY. (SEE TM 5-6115-464-34.)

2. PERFORM NO LOAD TEST ON STARTER. (SEE TM 9-4910-663-12.)

3. DIAGNOSE STARTER PROBLEMS.
   - Compare starter NO LOAD TEST results (see Starter, Page 15-130) with normal results below.

| | Amp | Rpm |
|---|---|---|
| Normal no load results: | 50 — 70 | 7000 — 9500 |

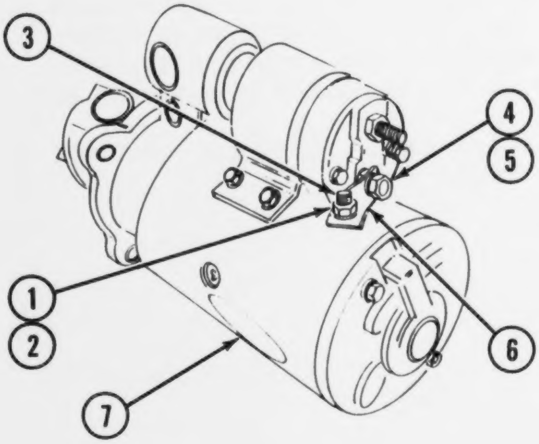
   - If results are not normal, perform repair action required. (See following Starter Diagnostic Chart.)
   - After completing repair action, perform no load test on starter. (See Starter, Page 15-130.)

*STARTER DIAGNOSTIC CHART*

| Test Result | Problem Cause | Repair Action |
|---|---|---|
| High current/low rpm | Bushings tight, dirty, or worn<br>Shorted armature. | Remove motor drive-clutch. (See Starter, Page 15-141.)<br>Remove lever housing. (See Starter, Page 15-150.)<br>Remove armature. (See Starter, Page 15-146.)<br>Remove field coil. (See Starter, Page 15-155.) |
| High current/no rpm | Terminal of fields grounded. | Remove field coil. (See Starter, Page 15-155.) |
| No current/no rpm | Open field circuit.<br>Armature: open coils, burned or dirty commutator.<br>Brushes broken or brush springs broken. | Remove field coil. (See Starter, Page 15-155.)<br>Remove armature. (See Starter, Page 15-146.)<br>Remove brushes. (See Starter, Page 15-137.) |
| Low current/low rpm | Poor connections or defective leads.<br>Commutator dirty.<br>Same as no current/no rpm. | Remove field coil. (See Starter, Page 15-155.)<br>Remove armature. (See Starter, Page 15-146.)<br>Same as no current/no rpm. |
| High current/high rpm | Fields shorted. | Remove field coil. (See Starter, Page 15-155.) |

## B. SOLENOID SWITCH REMOVAL

1. REMOVE SWITCH CONNECTOR FROM STARTER.
   - Remove nut (1) and lock washer (2) from terminal stud (3). Use 5/8 inch socket with ratchet handle. Discard lock washer.
   - Remove nut (4), lock washer (5) and connector (6) from starter (7). Use 5/8 inch socket with ratchet handle. Discard lock washer.



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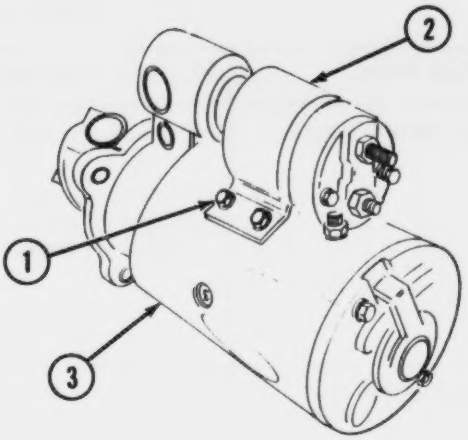
## B. SOLENOID SWITCH REMOVAL — Continued

2. REMOVE SOLENOID SWITCH FROM STARTER.
   - Remove four screws (1) and solenoid switch (2) from starter (3). Use 7/16 inch socket with ratchet handle.



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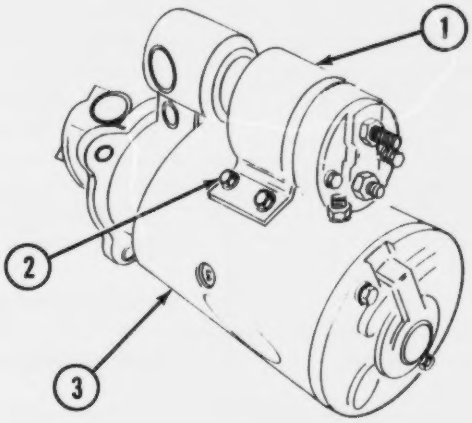
## C. SOLENOID SWITCH INSTALLATION

1. INSTALL SOLENOID SWITCH ON STARTER.
   - Install solenoid switch (1) and four screws (2) on starter (3). Use 7/16 inch socket with ratchet handle.



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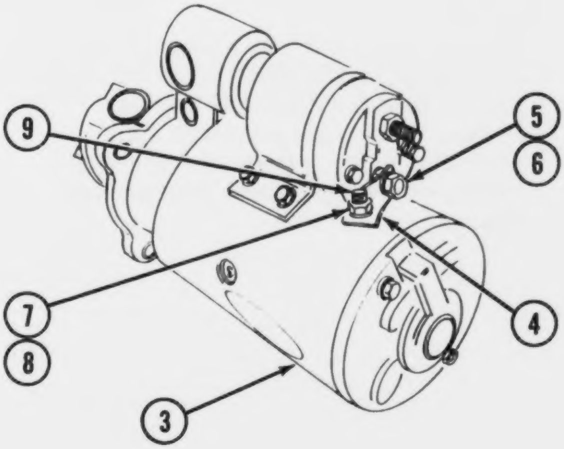
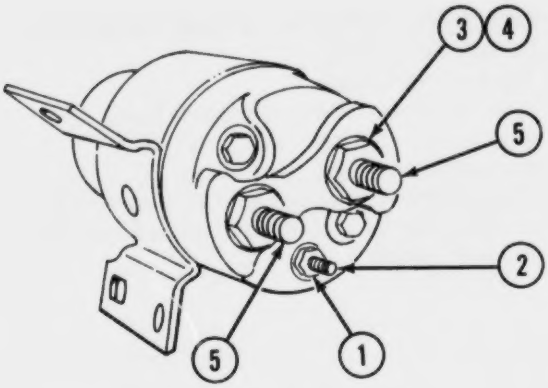
2. INSTALL SWITCH CONNECTOR ON STARTER.
   - Install connector (4), new lock washer (5) and nut (6) on starter (3). Do not tighten.
   - Install new lock washer (7) and nut (8) on terminal stud (9). Use 5/8 inch socket with ratchet handle.
   - Tighten nut (6). Use 5/8 inch socket with ratchet handle.



## D. SOLENOID SWITCH DISASSEMBLY

1. REMOVE NUTS AND WASHERS FROM THREE TERMINAL STUDS.
   - Remove nut (1) from terminal stud (2). Use 3/8 inch socket with ratchet handle.
   - Remove two nuts (3) and washers (4) from two terminal studs (5). Use 5/8 inch socket with ratchet handle.



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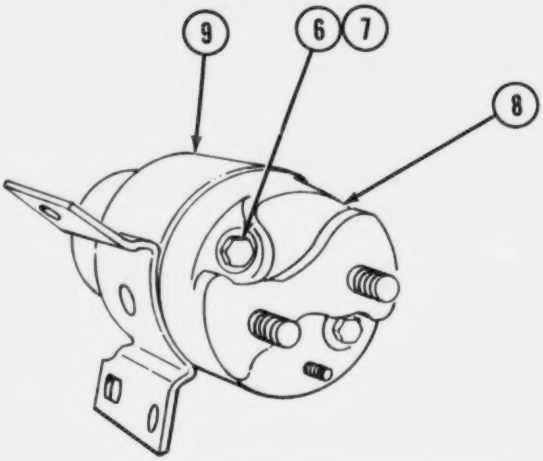
2. REMOVE COVER FROM SOLENOID SWITCH.
   - Remove two screws (6), washers (7), and cover (8) from solenoid switch (9). Use 5/16 inch socket with 1/4 inch drive ratchet handle.



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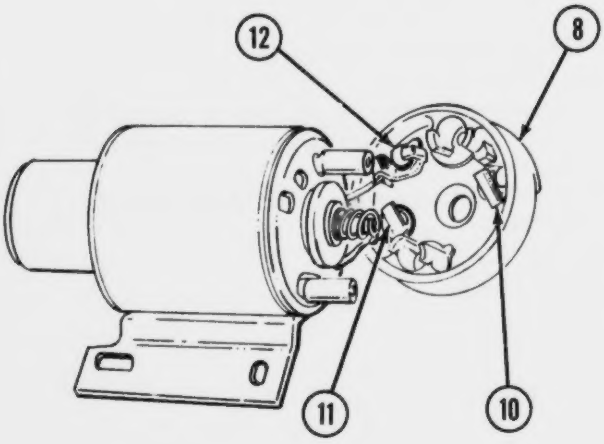
3. REMOVE THREE TERMINAL STUDS FROM COVER.
   - Remove battery terminal stud (10), motor terminal stud (11), and switch terminal stud (12) from cover (8).



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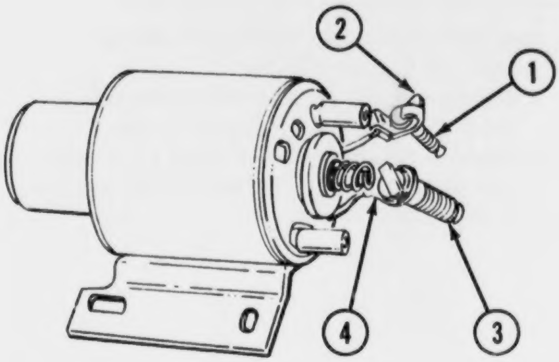
## D. SOLENOID SWITCH DISASSEMBLY — Continued

4. REMOVE TWO TERMINAL STUDS FROM TWO ELECTRICAL LEADS.
   - Tag and mark leads.
   - Remove switch terminal stud (1) from switch lead (2). Use 1/4 inch flat tip screwdriver and slip joint pliers.
   - Remove motor terminal stud (3) from motor lead (4). Use 1/4 inch flat tip screwdriver and slip joint pliers.



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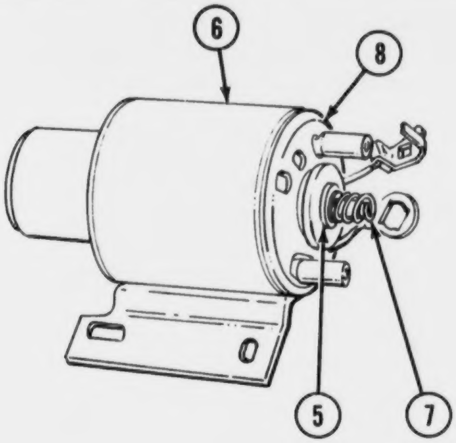
5. REMOVE CONTACT AND PUSH ROD FROM SOLENOID SWITCH.
   - Remove contact and push rod (5) from solenoid switch (6).
   - Remove contact return spring (7) from contact and push rod (5).
   - Remove gasket (8) from solenoid switch (6). Discard gasket.



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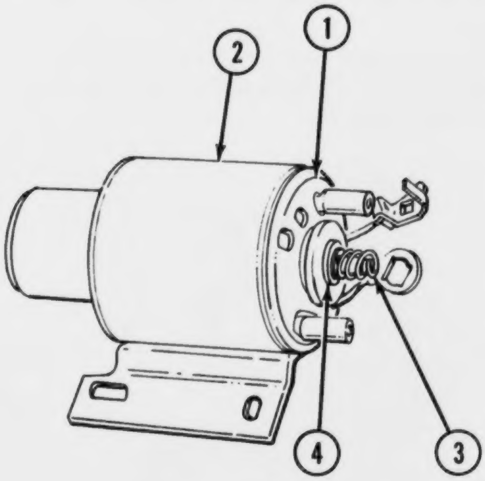
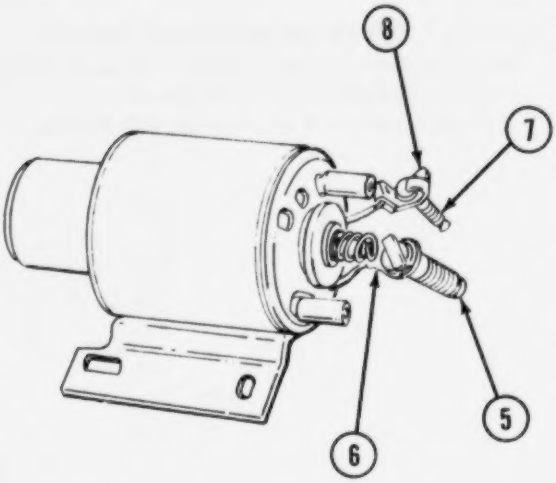
## E. SOLENOID SWITCH REASSEMBLY

1. INSTALL CONTACT AND PUSH ROD ON SOLENOID SWITCH.
   - Install new gasket (1) on solenoid switch (2).
   - Install contact return spring (3) on contact and push rod (4).
   - Install contact and push rod (4) on solenoid switch (2).



2. INSTALL TWO TERMINAL STUDS ON TWO ELECTRICAL LEADS.
   - Install motor terminal stud (5) on motor lead (6). Use slip joint pliers.
   - Install switch terminal stud (7) on switch lead (8). Use slip joint pliers.
   - Remove tags from leads.



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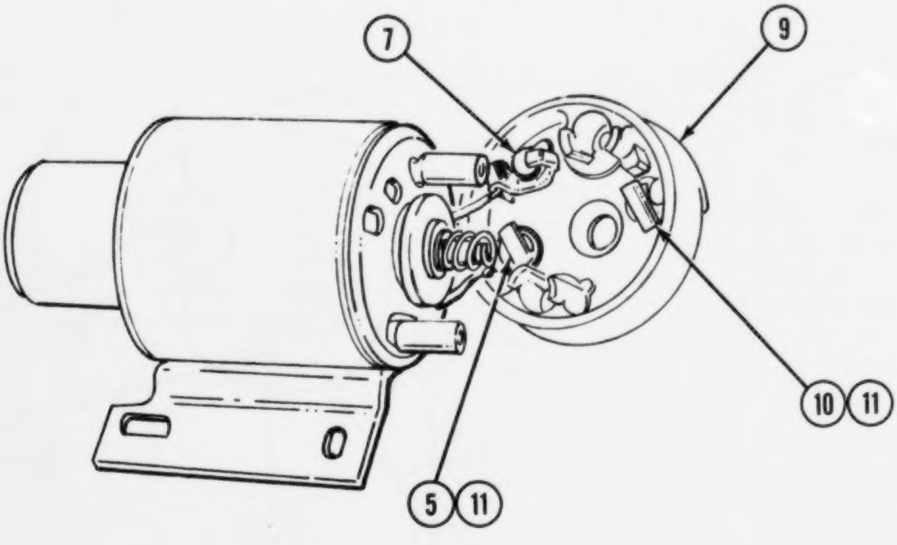
3. INSTALL THREE TERMINAL STUDS ON COVER.
   - Install switch terminal stud (7) on cover (9).
   - Install battery terminal stud (10) and motor terminal stud (5) on cover (9) with contacts (11) toward center of cover.



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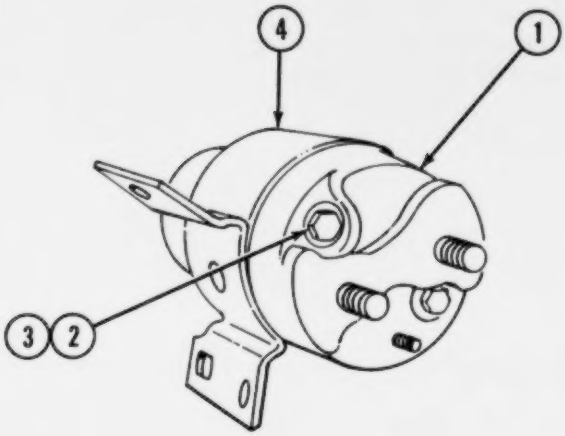
## E. SOLENOID SWITCH REASSEMBLY — Continued

4. INSTALL COVER ON SOLENOID SWITCH.
   - Install cover (1), two washers (2), and screws (3) on solenoid switch (4). Use 5/16 inch socket and 1/4 inch drive ratchet handle.



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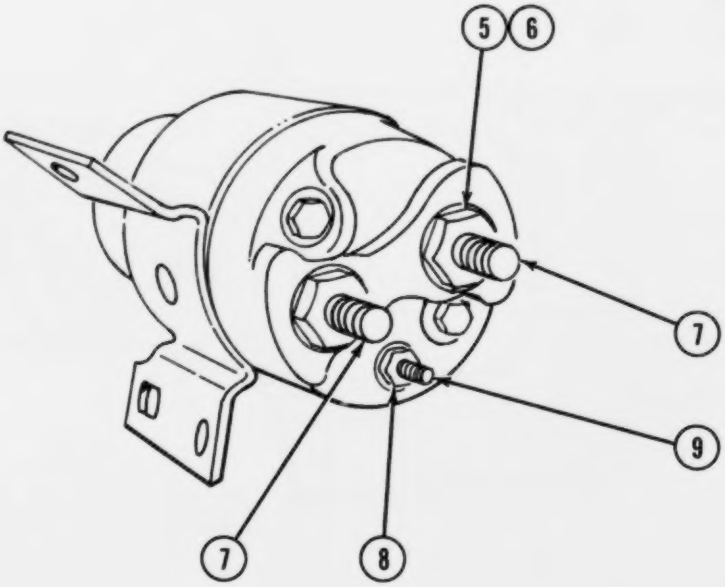
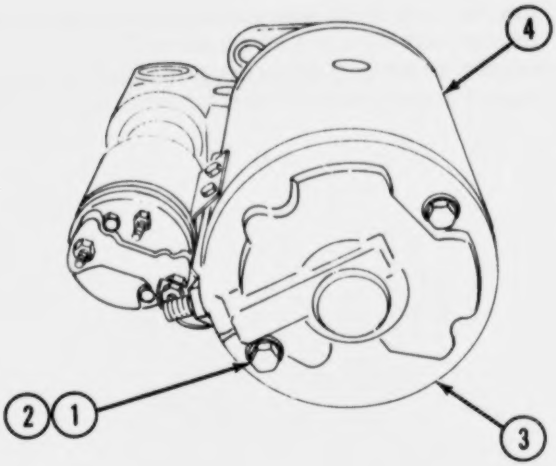
5. INSTALL NUTS AND WASHERS ON THREE TERMINAL STUDS.
   - Install two washers (5) and nuts (6) on two terminal studs (7). Use 5/8 inch socket with ratchet handle.
   - Install nut (8) on terminal stud (9). Use 3/8 inch socket with ratchet handle.



## F. BRUSH REMOVAL

1. REMOVE COMMUTATOR END FRAME FROM STARTER.
    - Remove two thru-bolts (1), lock washers (2), and commutator end frame (3) from starter (4). Use 7/16 inch socket with ratchet handle. Discard lock washers.



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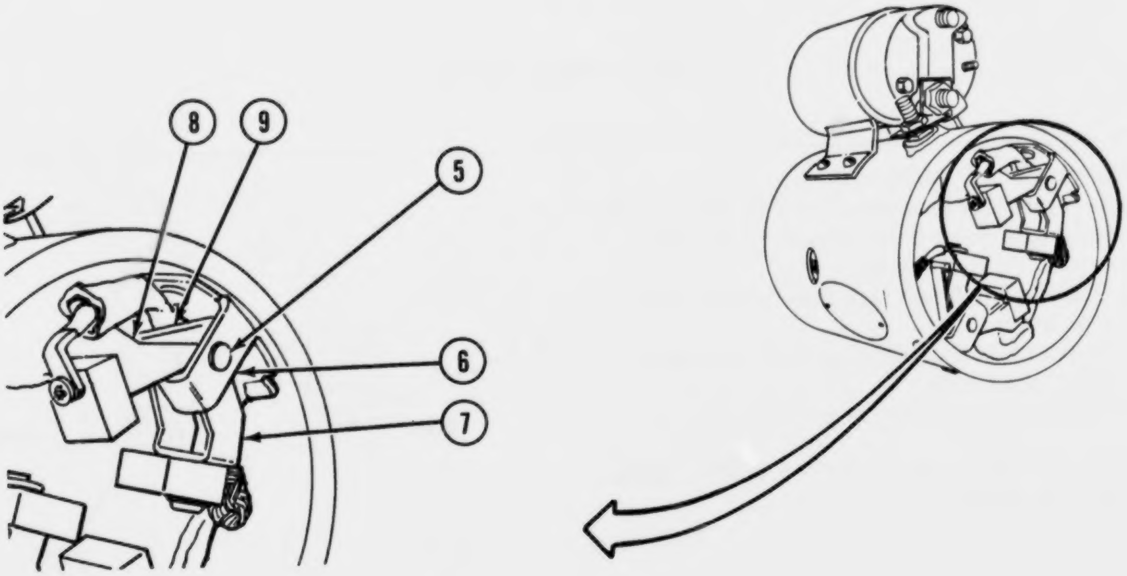
2. REMOVE FOUR BRUSHES FROM BRACKETS.
    - Remove pin (5) from bracket (6).
    - Remove ground brush holder (7), insulated brush holder (8), and brush spring (9) from bracket (6).
    - Repeat above removal steps for other pin, two brush holders, and spring.



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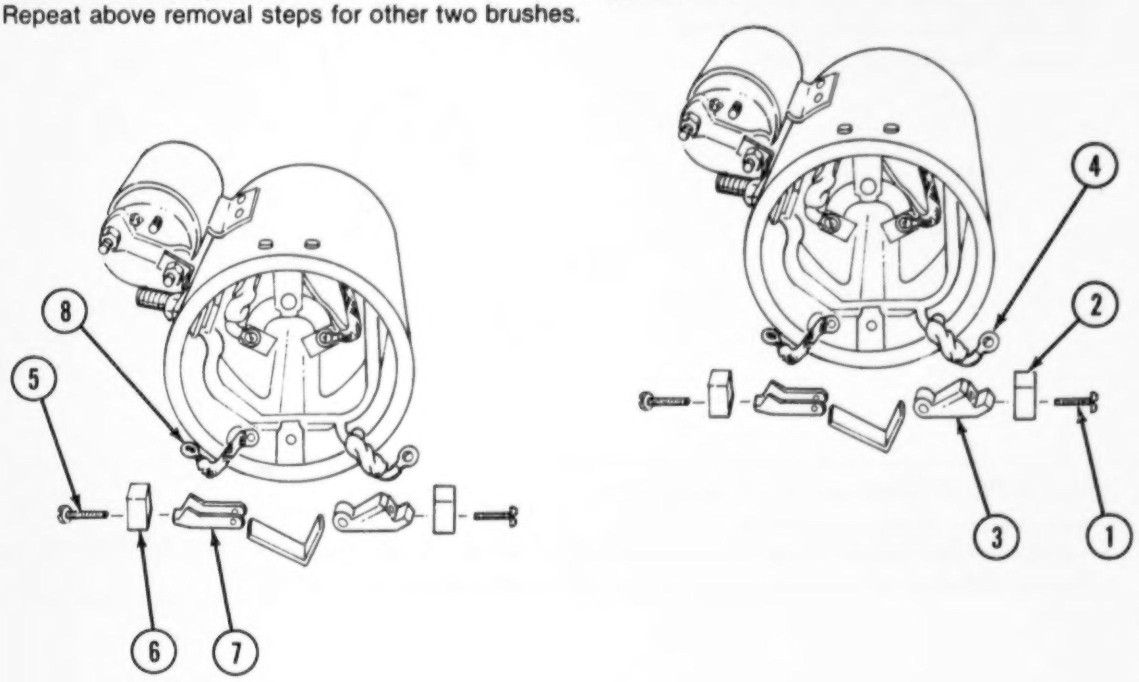
**F. BRUSH REMOVAL — Continued**

- Remove screw and captive washer (1), brush (2), and insulated brush holder (3) from coil lead (4). Use No. 2 cross tip screwdriver. Discard screw and captive washer.
- Remove screw and captive washer (5), brush (6), and ground brush holder (7) from ground lead (8). Use No. 2 cross tip screwdriver. Discard screw and captive washer.
- Repeat above removal steps for other two brushes.



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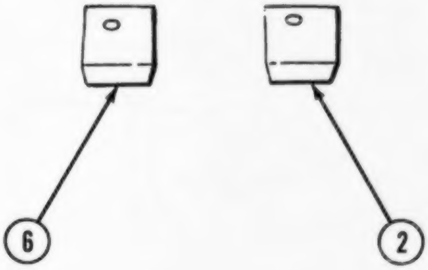
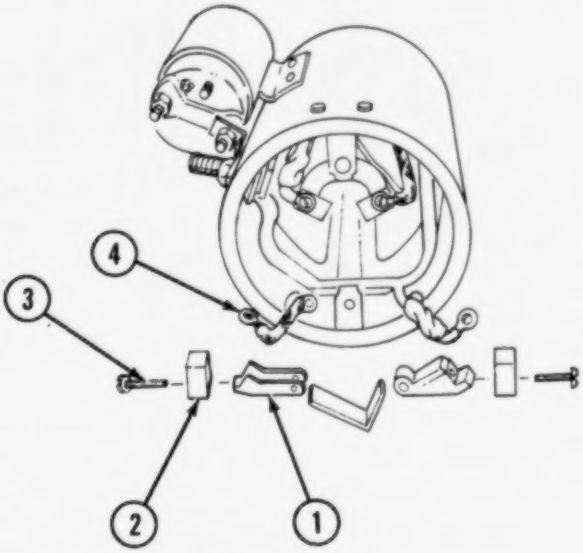
3. INSPECT FOUR BRUSHES.
   - Measure four brushes (2) and (6). Use 6 inch steel rule. Each brush should be at least 5/16 in. (1.58 cm) length.
   - Replace any brush less than 5/16 in. (1.58 cm) length.
   - Inspect four brushes (2) and (6) for cracks and uneven wear.
   - Replace any cracked or worn brush.

4. INSTALL FOUR BRUSHES ON STARTER. (SEE STARTER, PAGE 15-139.)



## G. BRUSH INSTALLATION

1. INSTALL FOUR BRUSHES ON BRACKETS.
   - Install ground brush holder (1), brush (2), and new screw and captive washer (3) on ground lead (4). Use No. 2 cross tip screwdriver.
   - Install insulated brush holder (5), brush (6), and new screw and captive washer (7) on coil lead (8). Use No. 2 cross tip screwdriver.
   - Repeat above installation steps for other two brushes.



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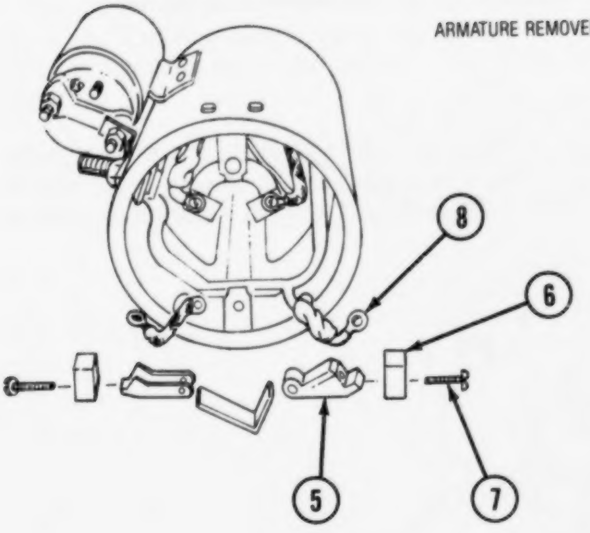

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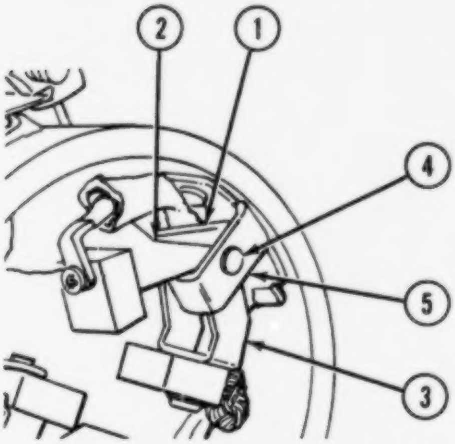
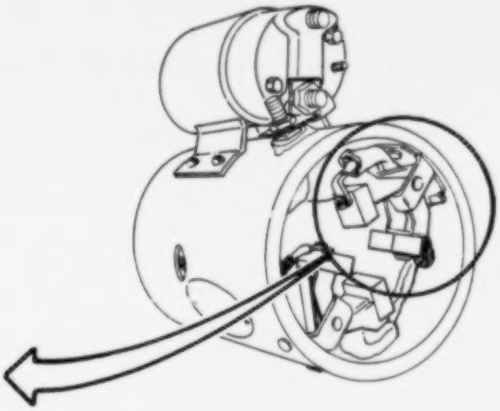
## G. BRUSH INSTALLATION — Continued

- Install brush spring (1), insulated brush holder (2), ground brush holder (3), and pin (4) on bracket (5).
- Repeat above installation step for other spring, two brush holders, and pin.





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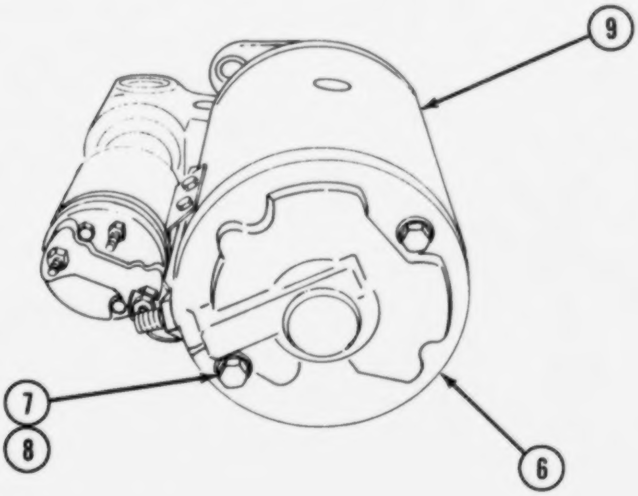
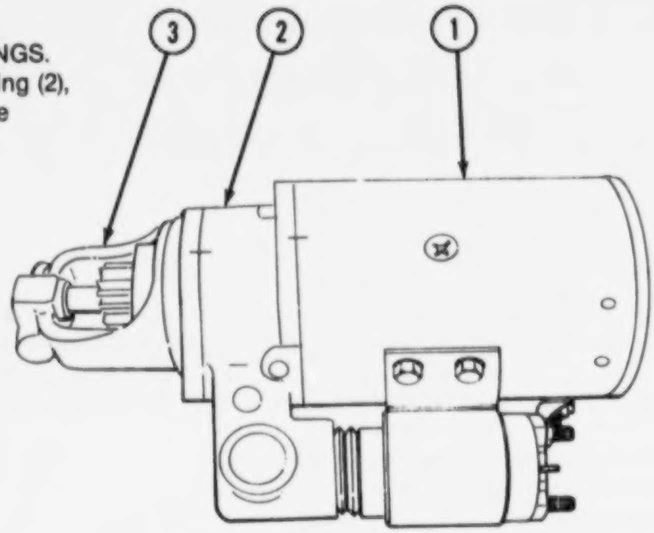
2. INSTALL COMMUTATOR END FRAME ON STARTER.
   - Install commutator end frame (6), two new lock washers (7), and thru-bolts (8) on starter (9). Use 7/16 inch socket with ratchet handle.



## H. MOTOR DRIVE-CLUTCH REMOVAL

1. REMOVE COMMUTATOR END FRAME FROM STARTER. (SEE STARTER, PAGE 15-137.)

2. MATCH MARK THREE STARTER HOUSINGS.
   - Match mark field frame (1), lever housing (2), and motor drive-clutch housing (3). Use scriber.



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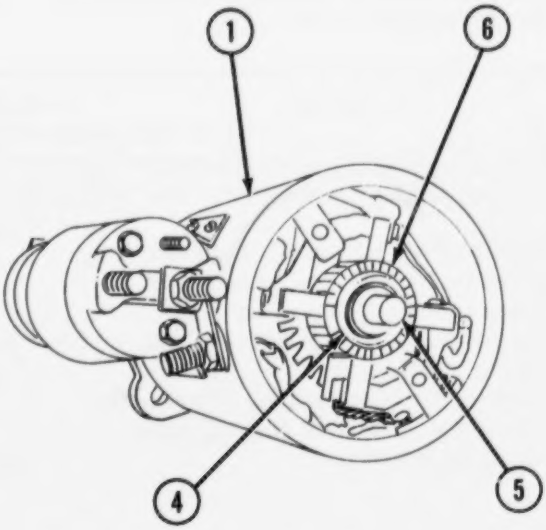
**CAUTION**

Armature windings can be easily damaged. Remove armature from field frame carefully.

3. REMOVE ARMATURE FROM FIELD FRAME.
   - Remove washer (4) from armature shaft (5).
   - Remove armature (6) from field frame (1).



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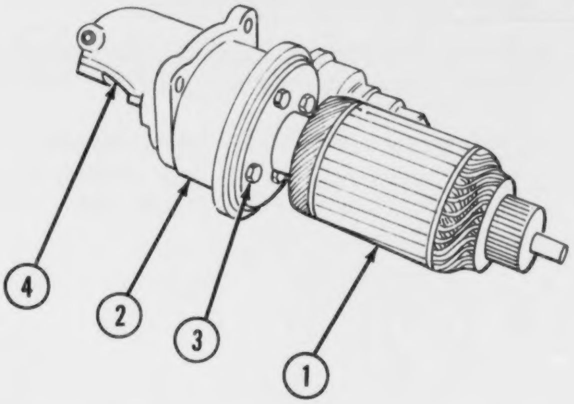
## H. MOTOR DRIVE-CLUTCH REMOVAL — Continued

4. REMOVE DRIVE HOUSING FROM LEVER HOUSING.
   - Pull armature (1) away from lever housing (2).
   - Loosen four attaching bolts (3). Use 1/2 inch box end wrench.
   - Remove drive housing (4) from lever housing (2).



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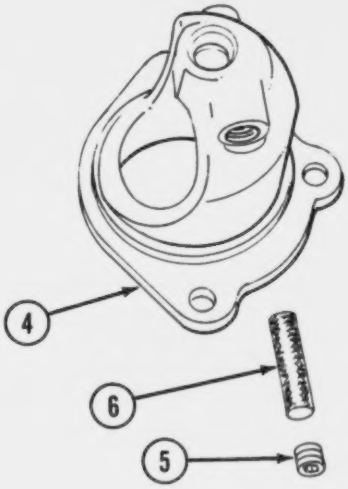
**CAUTION**

Heavy weight oils can cause starter to bind in cold weather. Use only OEA oil to soak wick.

**NOTE**

Suitable container must hold at least 2 oz. (5.9 ml).

5. REMOVE DRIVE END WICK FROM DRIVE HOUSING.
   - Remove pipe plug (5) and wick (6) from drive housing (4). Use 3/16 inch hex key.
   - Soak wick (6) until reassembly. Use OEA oil and suitable container.



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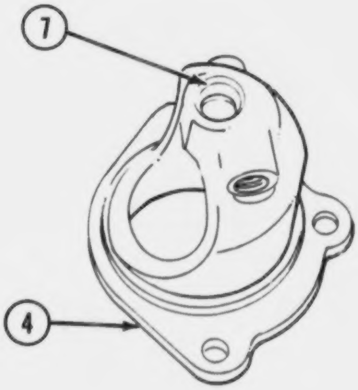
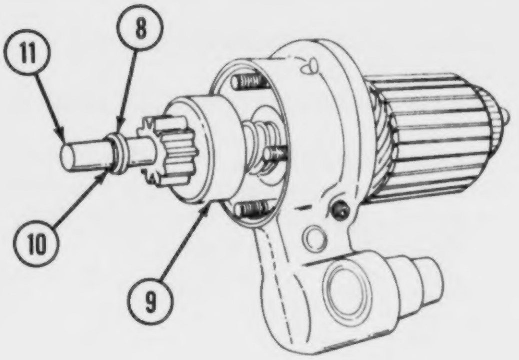
**NOTE**

Do not remove drive housing bushing unless bushing is damaged.

6. INSPECT DRIVE HOUSING BUSHING.
   - Dress bushing (7). Use crocus cloth.
   - Clean bushing (7). Use clean rag.
   - Inspect bushing (7). Bushing should not be scored, cracked, or out of round.
   - Remove damaged bushing (7) from drive housing (4). Use arbor press. Discard damaged bushing.



7. REMOVE RETAINING RING FROM ARMATURE SHAFT.
   - Tap pinion stop collar (8) toward motor drive-clutch (9). Use 1/2 inch pipe coupling and ball peen hammer.
   - Remove retaining ring (10) from armature shaft (11). Use retaining ring pliers. Discard retaining ring.



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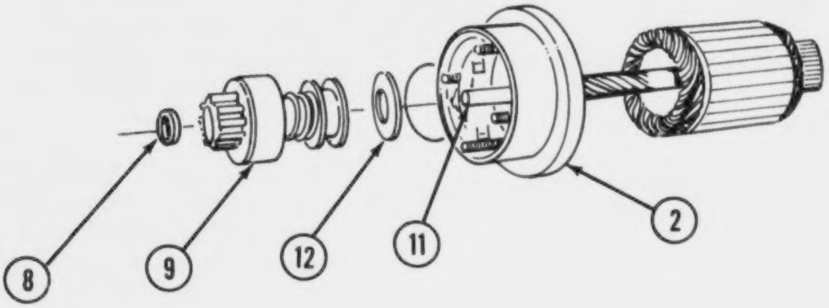
8. REMOVE MOTOR DRIVE-CLUTCH FROM LEVER HOUSING.
   - Remove pinion stop collar (8) from armature shaft (11).
   - Remove armature shaft (11) from motor drive-clutch (9), and brake washer (12) from lever housing (2).



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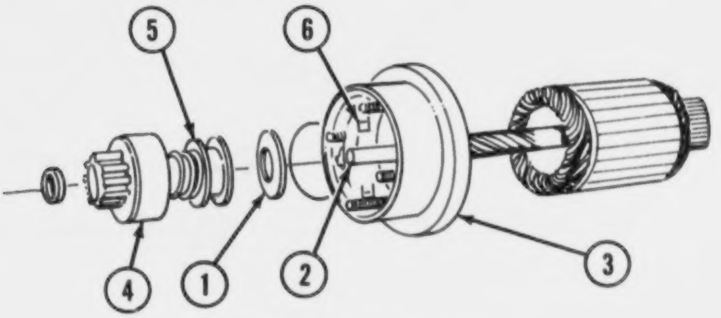
## I. MOTOR DRIVE-CLUTCH INSTALLATION

1. INSTALL MOTOR DRIVE-CLUTCH IN LEVER HOUSING.
   - Apply light coat of oil to brake washer (1) and armature shaft (2).
   - Install armature shaft (2) in lever housing (3) far enough to hold brake washer (1).
   - Position motor drive-clutch (4) with pulley end (5) on shift lever (6) in lever housing (3).
   - Install armature shaft (2) in motor drive-clutch (4).



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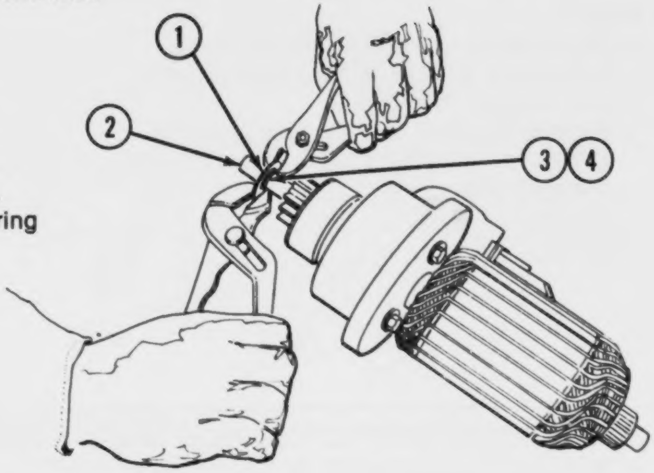
## I. MOTOR DRIVE-CLUTCH INSTALLATION — Continued

2. INSTALL NEW RETAINING RING ON ARMATURE SHAFT.
   - Install pinion stop collar (1) on armature shaft (2).
   - Install new retaining ring (3) in armature shaft groove (4). Use retaining ring pliers.
   - Install pinion stop collar (1) on retaining ring (3). Use two slip joint pliers.



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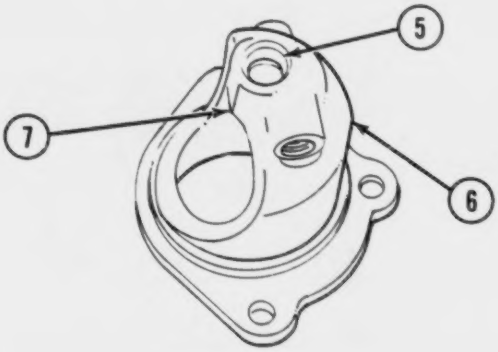
**NOTE**

If bushing was not removed, go to step 4.

3. INSTALL NEW DRIVE END BUSHING IN DRIVE HOUSING.
   - Install new bushing (5) in drive housing (6) until flush with inside face (7). Use arbor press.



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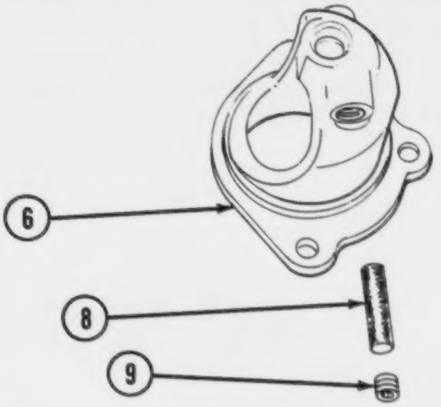
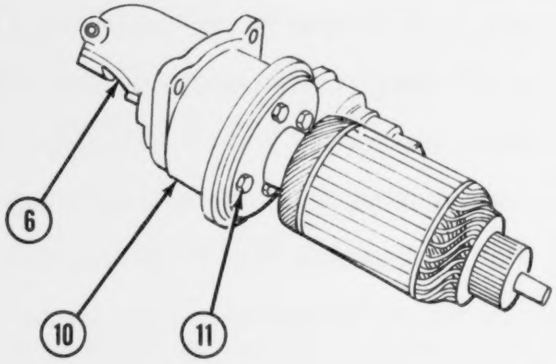
4. INSTALL DRIVE END WICK IN DRIVE HOUSING.
   - Install wick (8) and pipe plug (9) in drive housing (6). Use 3/16 inch hex key.



**NOTE**

Torque wrench dial reading is too low when using torque adapter. To apply correct torque, read reference material supplied with torque wrench.

5. INSTALL DRIVE HOUSING ON LEVER HOUSING.
   - Position drive housing (6) on lever housing (10), with marks on drive housing and lever housing alined.
   - Torque four attaching bolts (11) to 11 — 15 ft lb (1.5 — 2.1 mkg). Use 1/2 inch crowfoot attachment, 3/8 inch to 1/2 inch socket wrench adapter, and 3/8 inch drive torque wrench.



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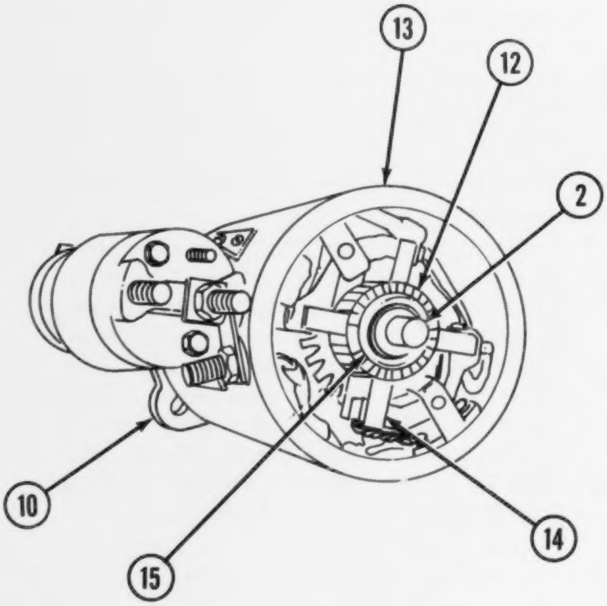
**CAUTION**

Armature windings and brushes can be easily damaged. Install armature carefully in field frame.

6. INSTALL ARMATURE IN FIELD FRAME.
   - Install armature (12) in field frame (13) until armature contacts four brushes (14).
   - Pull four brushes (14) apart, and push armature (12) all the way into field frame (13). Use helper.
   - Install washer (15) on armature shaft (2).
   - Aline marking on field frame (13) with marking on lever housing (10).
7. INSTALL COMMUTATOR END FRAME ON STARTER. (SEE STARTER, PAGE 15-140.)



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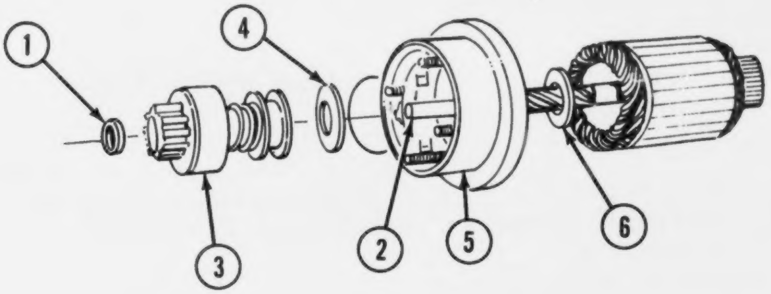
## 15-13 STARTER — Continued

### J. ARMATURE REMOVAL

1. REMOVE COMMUTATOR END FRAME FROM STARTER. (SEE STARTER, PAGE 15-137.)
2. MARK THREE STARTER HOUSINGS. (SEE STARTER, PAGE 15-141.)
3. REMOVE ARMATURE FROM FIELD FRAME. (SEE STARTER, PAGE 15-141.)
4. REMOVE DRIVE HOUSING FROM LEVER HOUSING. (SEE STARTER, PAGE 15-142.)
5. REMOVE RETAINING RING FROM ARMATURE SHAFT. (SEE STARTER, PAGE 15-143.)
6. REMOVE ARMATURE FROM MOTOR DRIVE-CLUTCH.
   - Remove pinion stop collar (1) from armature shaft (2).
   - Remove armature shaft (2) from motor drive-clutch (3), and brake washer (4) from lever housing (5).
   - Remove washer (6) from armature shaft (2).



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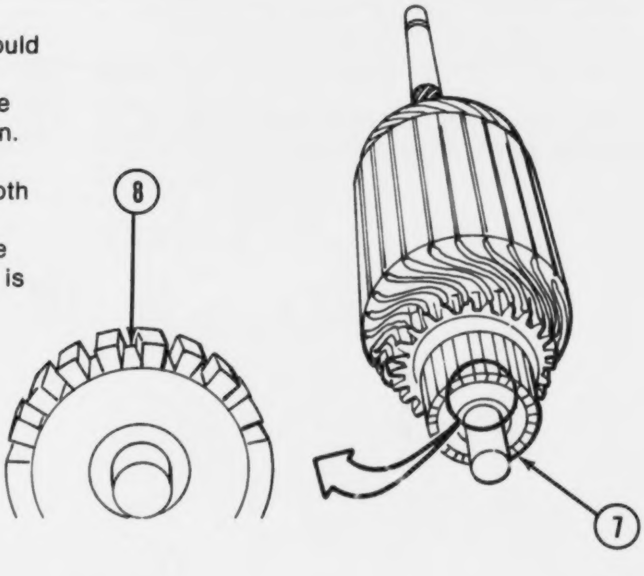
7. INSPECT COMMUTATOR.
   - Inspect commutator (7). Commutator should not be cracked, scored, or out of round.
   - Check depth of commutator slots (8). Use depth gage. If depth is more than 0.031 in. (0.787 mm), discard armature. If depth is 0.031 in. (0.787 mm) or less, undercut depth to 0.025 — 0.031 in. (0.634 — 0.787 mm).
   - Check width of commutator slots (8). Use vernier caliper. Discard armature if width is more than 0.031 in. (0.787 mm).



**WARNING**

Compressed air can hurt you. Never aim air at soldiers or use more pressure than 30 psi (207 kPa). Always wear goggles.

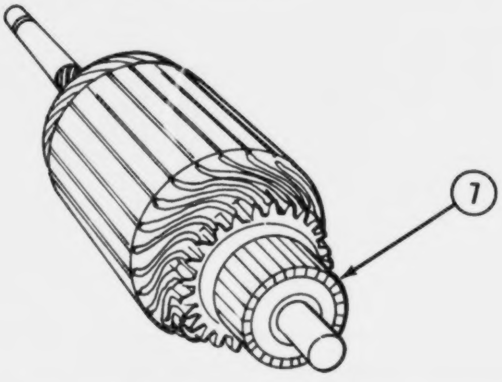
**CAUTION**

Cleaning solvent can damage starter. Do not use cleaning solvent to clean commutator.

• • • •

Emery particles short out commutator. Do not use emery paper to clean commutator.

8. CLEAN COMMUTATOR.
   - Clean commutator (7). Use 100 grit flint abrasive paper.
   - Remove dust from commutator (7). Use low pressure air from air compressor and blow gun.



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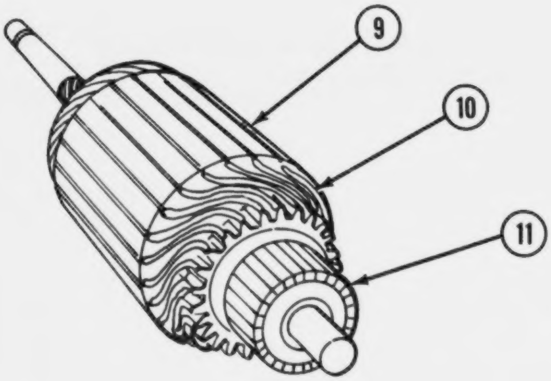
9. INSPECT ARMATURE FOR OPEN CIRCUIT.
   - Inspect armature (9). Conductors (10) should not be broken, and commutator riser bars (11) should not be burned.
   - If conductors (10) or riser bars (11) are broken, armature is faulty.



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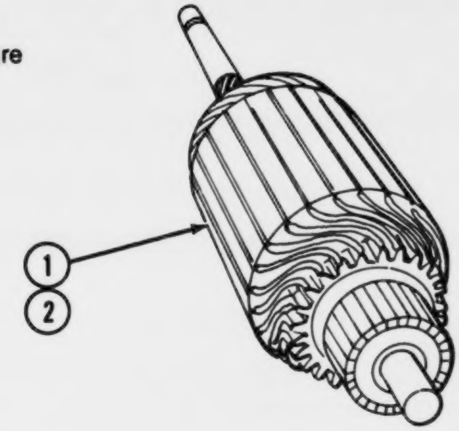
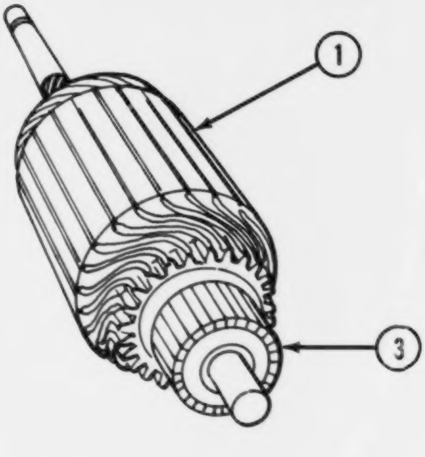
## J. ARMATURE REMOVAL — Continued

10. INSPECT ARMATURE FOR SHORT CIRCUIT.
    - Place armature (1) on armature test set.
    - Turn on armature test set.
    - Hold hacksaw blade slightly above armature coil (2) while armature (1) turns.
    - If hacksaw blade vibrates, armature is faulty.



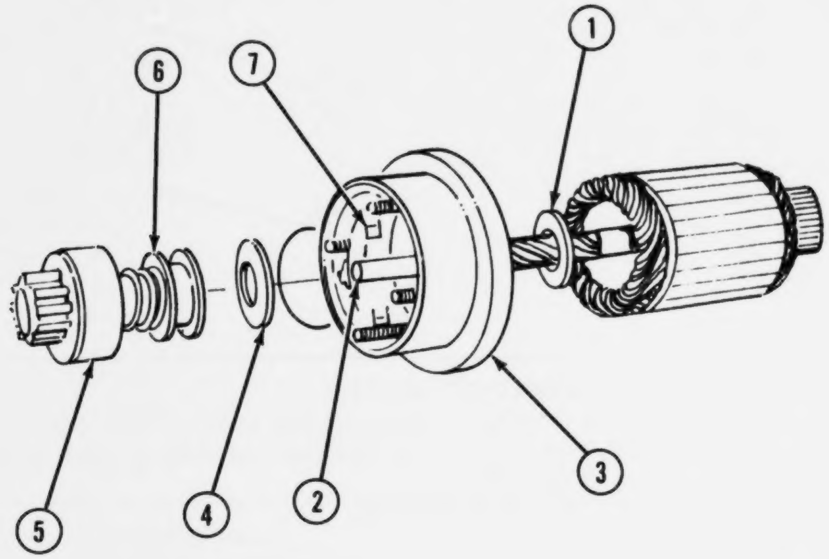
11. INSPECT ARMATURE FOR GROUNDING.
    - Set multimeter to ohms, and zero multimeter.
    - Connect one multimeter lead to armature (1).
    - Touch other multimeter lead to each commutator riser bar (3). Resistance should be infinite at each commutator riser bar.
    - If multimeter needle swings to zero, jumps, or flickers, armature is faulty.

12. INSTALL ARMATURE IN STARTER. (SEE STARTER, PAGE 15-149.)



## K. ARMATURE INSTALLATION

1. INSTALL ARMATURE IN MOTOR DRIVE-CLUTCH.
   - Apply light coat of oil to washer (1) and armature shaft (2).
   - Install armature shaft (2) in lever housing (3) far enough to hold brake washer (4).
   - Position motor drive-clutch (5) with pulley end (6) on shift lever (7) in lever housing (3).
   - Install armature shaft (2) in motor drive-clutch (5).



2. INSTALL NEW RETAINING RING ON ARMATURE SHAFT. (SEE STARTER, PAGE 15-144.)

3. INSTALL DRIVE HOUSING ON LEVER HOUSING. (SEE STARTER, PAGE 15-145.)

4. INSTALL ARMATURE IN FIELD FRAME. (SEE STARTER, PAGE 15-145.)

5. INSTALL COMMUTATOR END FRAME ON STARTER. (SEE STARTER, PAGE 15-140.)

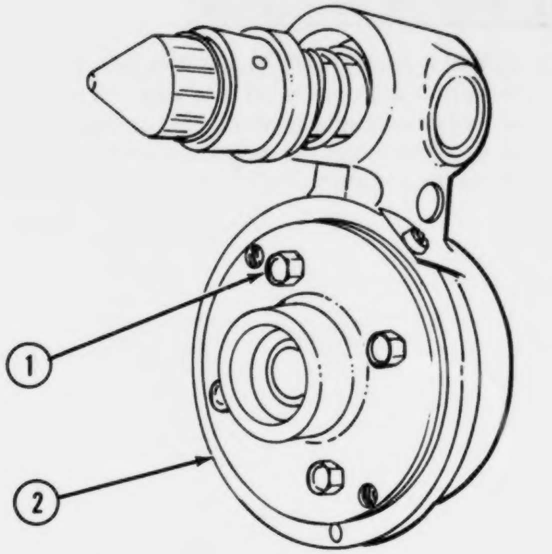
GO TO NEXT PAGE

## 15-13 STARTER — Continued

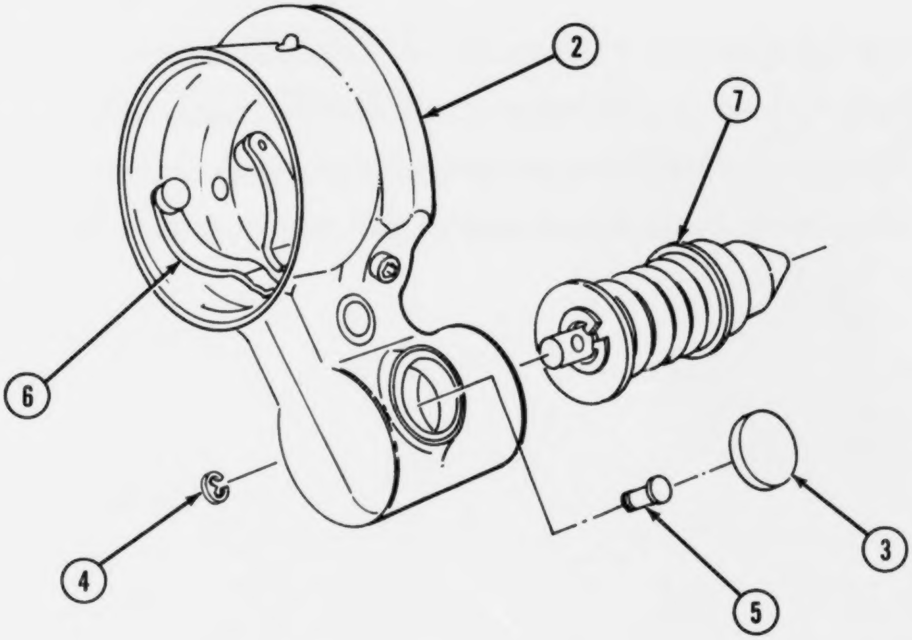
### L. LEVER HOUSING REMOVAL

1. REMOVE MOTOR DRIVE-CLUTCH FROM STARTER. (SEE STARTER, PAGE 15-141.)

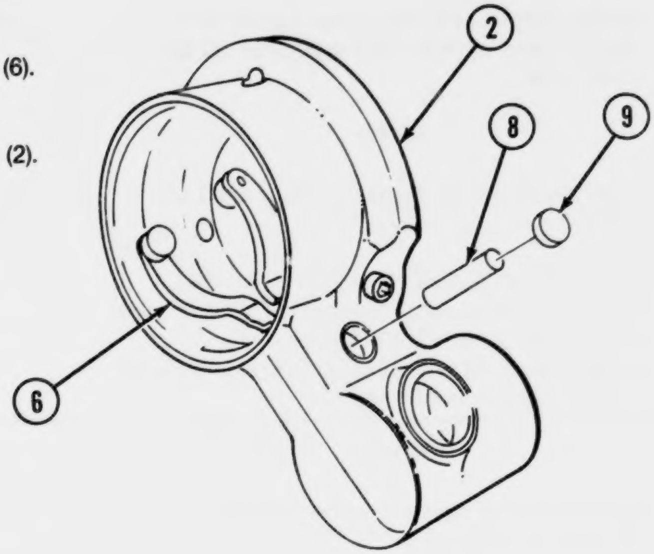
2. REMOVE FOUR ATTACHING BOLTS (1) FROM LEVER HOUSING (2).



3. REMOVE PLUNGER ASSEMBLY FROM LEVER HOUSING.
   - Remove two expansion plugs (3) from lever housing (2). Use center punch. Discard plugs.
   - Remove retaining ring (4) from lever shaft (5). Use retaining ring pliers. Discard retaining ring.
   - Remove lever shaft (5) from shift lever (6).
   - Remove plunger assembly (7) from lever housing (2).



4. REMOVE SHIFT LEVER FROM LEVER HOUSING.
   - Remove two expansion plugs (9) from lever housing (2). Use center punch. Discard plugs.
   - Remove attaching pin (8) from shift lever (6). Use 1/4 inch pin punch and ball peen hammer.
   - Remove shift lever (6) from lever housing (2).



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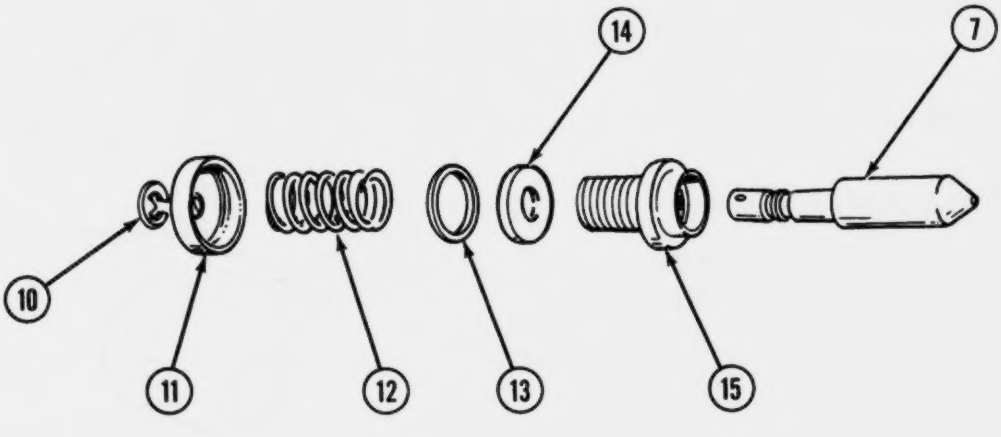
5. DISASSEMBLE PLUNGER ASSEMBLY.
   - Remove retaining ring (10) from plunger (7). Use retaining ring pliers. Discard retaining ring.
   - Remove spring retainer (11), spring (12), washer (13), and spring retainer (14) from plunger (7).
   - Remove boot (15) from plunger (7).



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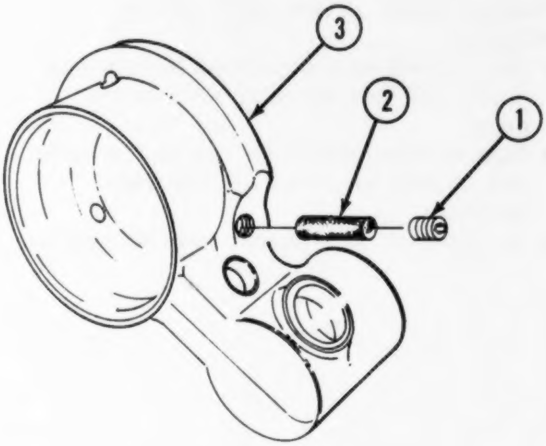
## L. LEVER HOUSING REMOVAL — Continued



**CAUTION**

Heavy weight oils can cause starter to bind in cold weather. Use only OEA oil to soak wick.

**NOTE**

Suitable container must hold at least 2 oz (5.9 ml).

6. REMOVE WICK FROM LEVER HOUSING.
   - Remove pipe plug (1) and wick (2) from lever housing (3). Use 3/16 inch hex key.
   - Soak wick (2) until reassembly. Use OEA oil and suitable container.

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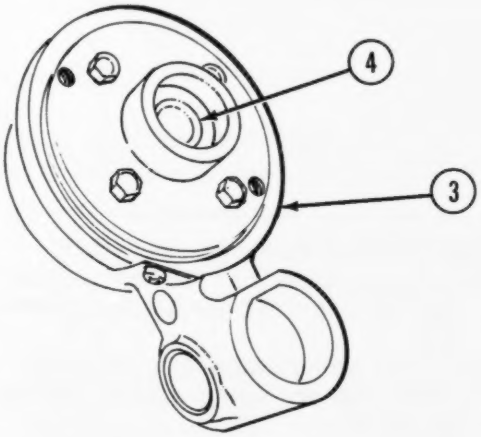

**NOTE**

Do not remove sleeve bushing unless bushing is damaged.

7. INSPECT LEVER HOUSING SLEEVE BUSHING.
   - Dress bushing (4). Use crocus cloth.
   - Clean bushing (4). Use clean rag.
   - Inspect bushing (4). Bushing should not be cracked, scored, or out of round.
   - Remove damaged bushing (4) from lever housing (3). Use arbor press.

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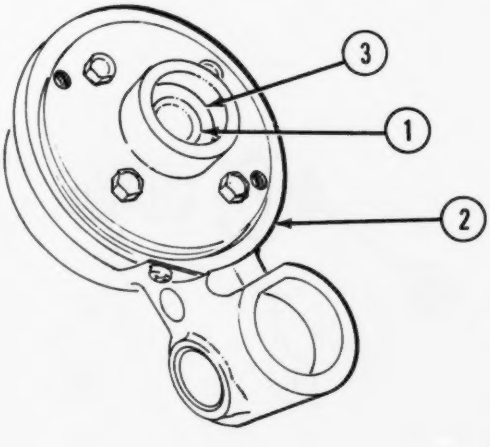
## M. LEVER HOUSING INSTALLATION

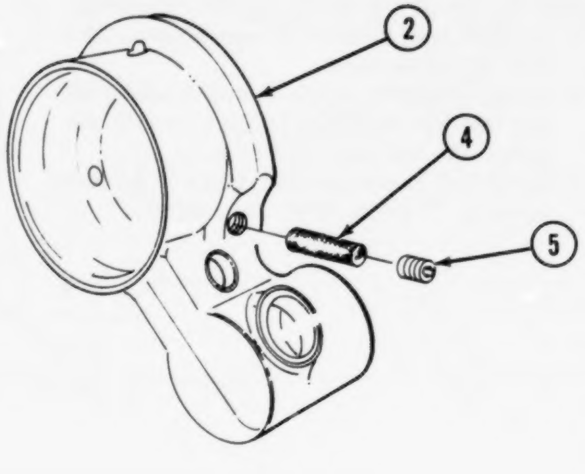


**NOTE**

If sleeve bushing was not removed, go to step 2.

1. INSTALL SLEEVE BUSHING IN LEVER HOUSING.
   - Install bushing (1) in lever housing (2) until flush with inner face of bore (3). Use arbor press.

2. INSTALL WICK IN LEVER HOUSING.
   - Install wick (4) and pipe plug (5) in lever housing (2). Use 3/16 inch hex key.



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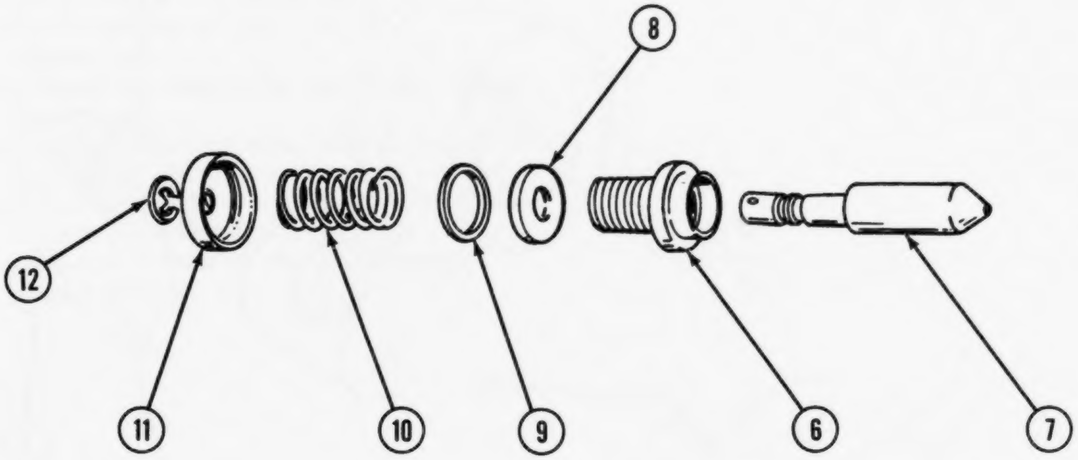
3. REASSEMBLE PLUNGER ASSEMBLY.
   - Install boot (6) on plunger (7).
   - Install spring retainer (8), washer (9), spring (10), and spring retainer (11) on plunger (7).
   - Install new retaining ring (12) on plunger (7). Use retaining ring pliers.



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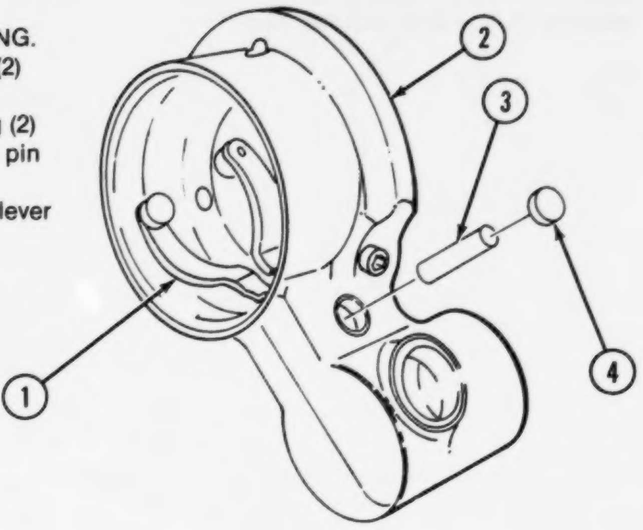
## M. LEVER HOUSING INSTALLATION — Continued

4. INSTALL SHIFT LEVER IN LEVER HOUSING.
   - Position shift lever (1) in lever housing (2) with pin holes alined.
   - Install attaching pin (3) in lever housing (2) and through shift lever (1). Use 1/4 inch pin punch and ball peen hammer.
   - Install two new expansion plugs (4) on lever housing (2). Use soft faced hammer.



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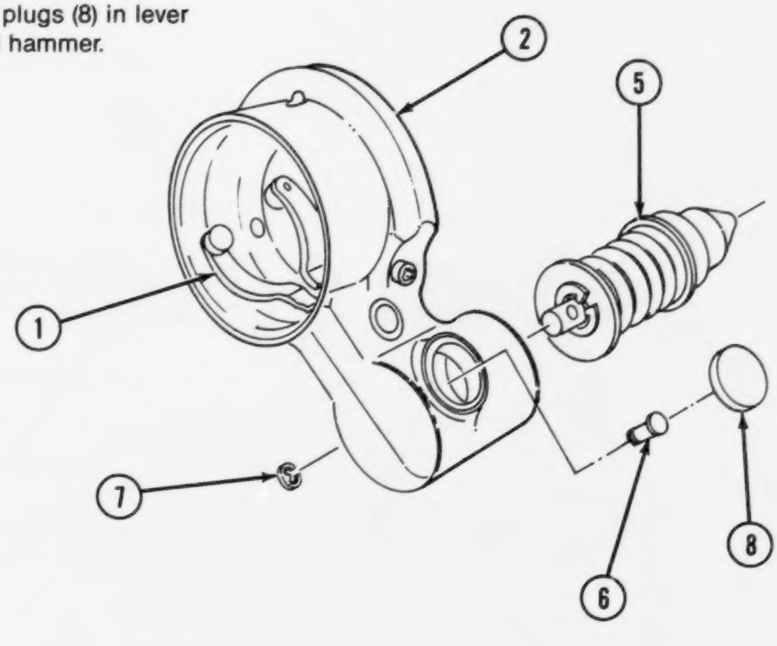
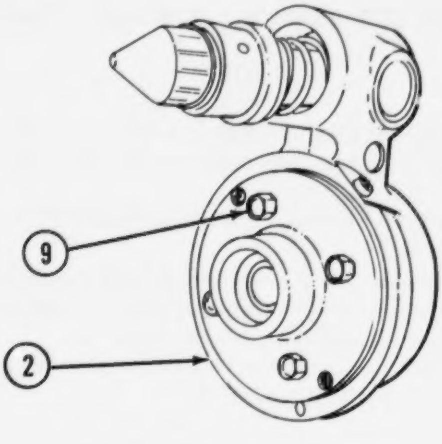
5. INSTALL PLUNGER ASSEMBLY IN LEVER HOUSING.
   - Install plunger assembly (5) in shift lever (1).
   - Install lever shaft (6) in shift lever (1).
   - Install new retaining ring (7) on lever shaft (6). Use retaining ring pliers.
   - Install two new expansion plugs (8) in lever housing (2). Use soft faced hammer.



6. INSTALL FOUR ATTACHING BOLTS (9) ON LEVER HOUSING (2).
7. INSTALL MOTOR DRIVE-CLUTCH ON STARTER. (SEE STARTER, PAGE 15-143.)



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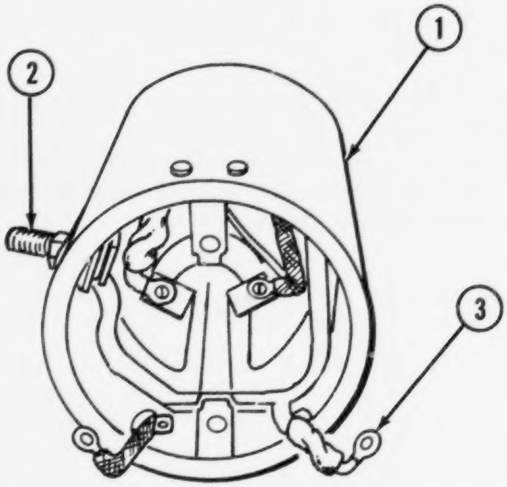
## N. FIELD COIL ASSEMBLY REMOVAL

1. REMOVE SWITCH CONNECTOR FROM STARTER. (SEE STARTER, PAGE 15-131.)
2. REMOVE SOLENOID SWITCH FROM STARTER. (SEE STARTER, PAGE 15-132.)
3. REMOVE COMMUTATOR END FRAME FROM STARTER. (SEE STARTER, PAGE 15-137.)
4. REMOVE FOUR BRUSHES FROM BRACKETS. (SEE STARTER, PAGE 15-137.)
5. MATCH MARK THREE STARTER HOUSINGS. (SEE STARTER, PAGE 15-141.)
6. REMOVE ARMATURE FROM FIELD FRAME. (SEE STARTER, PAGE 15-141.)
7. INSPECT FIELD COIL ASSEMBLY.
    - Set multimeter to ohms, and zero multimeter.
    - Connect one multimeter lead to field frame (1).
    - Connect other multimeter lead to field coil terminal (2). Multimeter should read infinity.
    - Disconnect multimeter lead from field frame (1), and connect multimeter lead to other field coil terminal (3). Multimeter needle should deflect.



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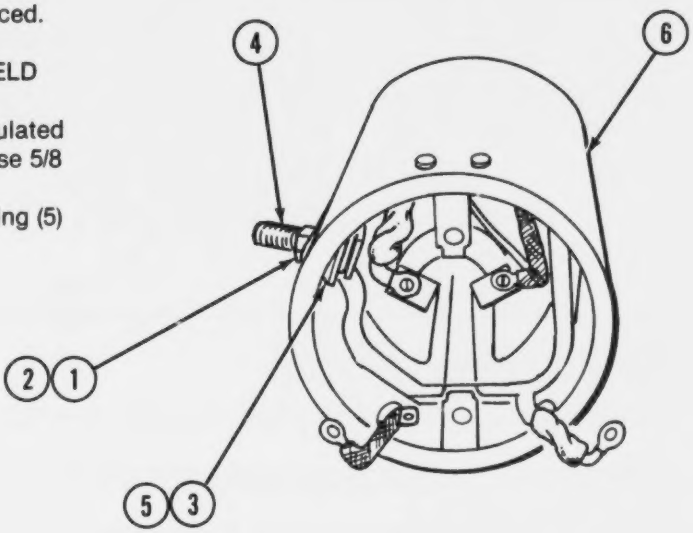
## N. FIELD COIL ASSEMBLY REMOVAL — Continued

**NOTE**

Do not remove terminal stud unless stud is damaged or field coil is to be replaced.

8. REMOVE TERMINAL STUD FROM FIELD FRAME.
   - Remove nut (1), washer (2), and insulated washer (3) from terminal stud (4). Use 5/8 inch socket with ratchet handle.
   - Remove terminal stud (4) and bushing (5) from field frame (6).



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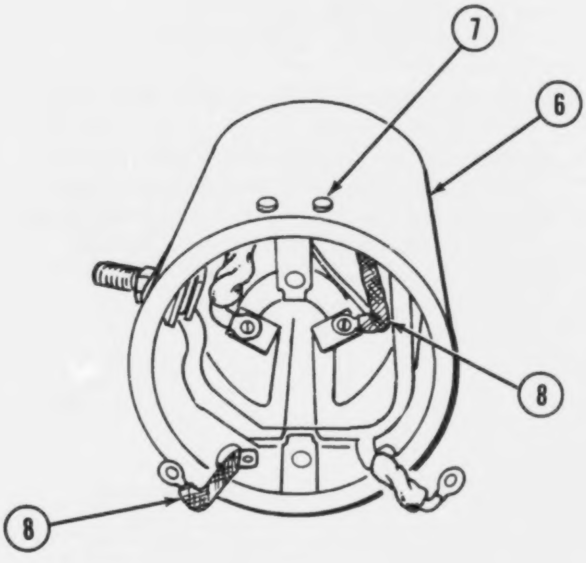
**NOTE**

Do not remove ground leads unless leads are damaged.

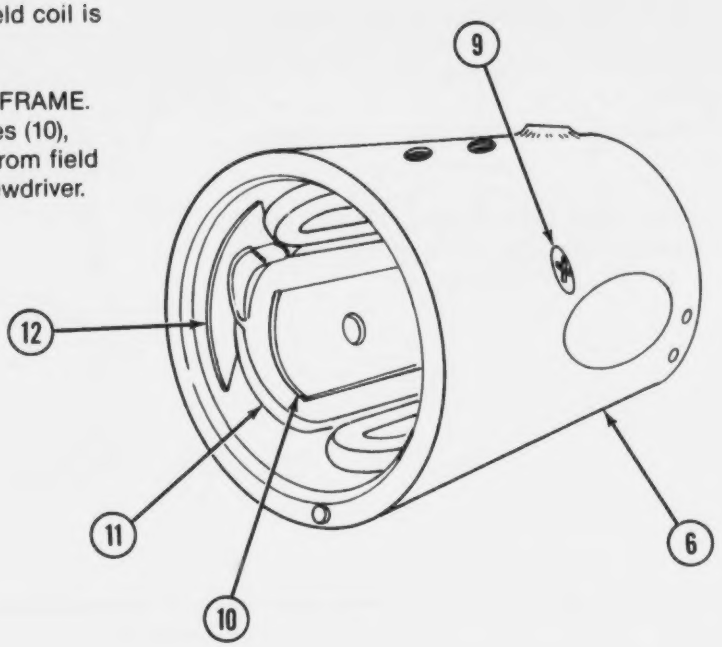
9. REMOVE TWO GROUND LEADS FROM FIELD FRAME.
   - Remove two rivets (7) and ground leads (8) from field frame (6). Use cold chisel and ball peen hammer. Discard rivets.



**NOTE**

Do not remove field coil unless field coil is to be replaced.

10. REMOVE FIELD COIL FROM FIELD FRAME.
    - Remove four screws (9), pole shoes (10), field coil (11), and insulation (12) from field frame (6). Use No. 3 cross tip screwdriver.



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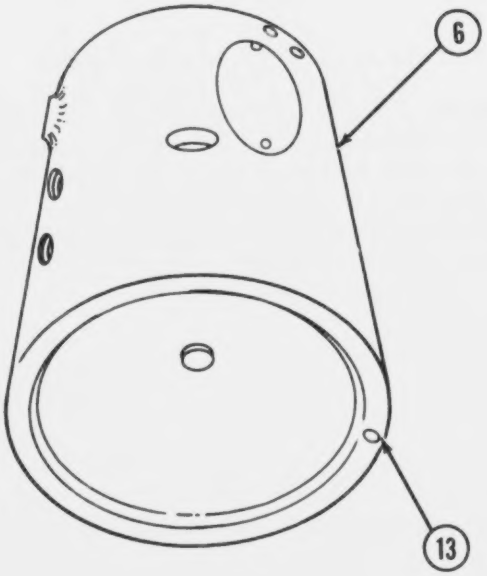
**NOTE**

Do not remove dowel pin unless pin is damaged.

11. REMOVE DOWEL PIN FROM FIELD FRAME.
    - Remove dowel pin (13) from field frame (6). Use wrench pliers. Discard dowel pin.



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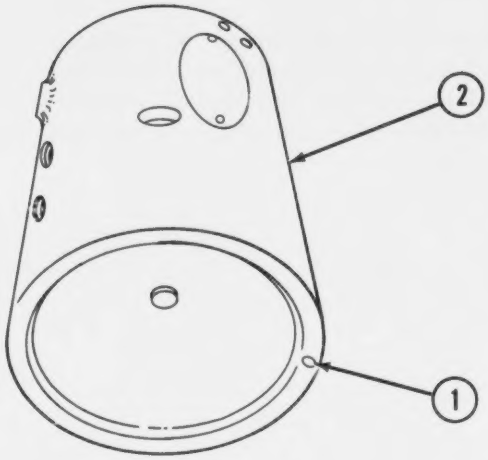
## O. FIELD COIL ASSEMBLY INSTALLATION

**NOTE**

If dowel pin was not removed, go to step 2.

1. INSTALL NEW DOWEL PIN IN FIELD FRAME.
   - Install new dowel pin (1) in field frame (2). Use ball peen hammer.



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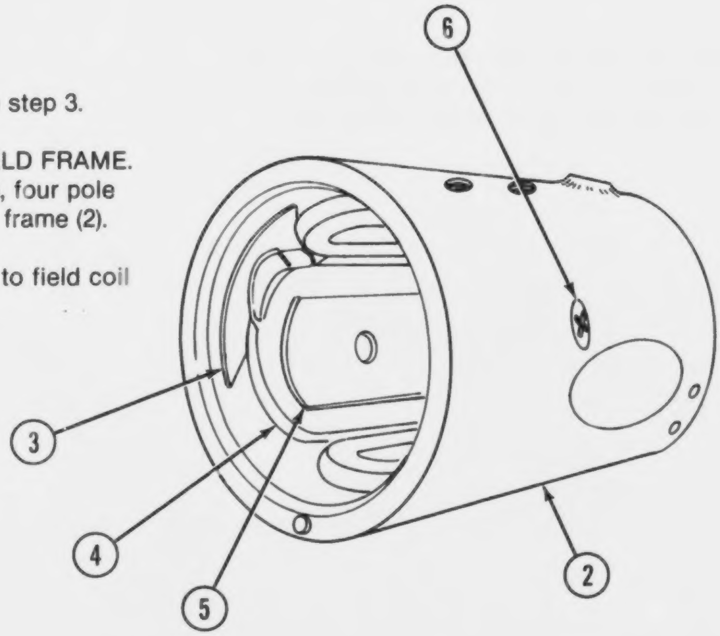
**CAUTION**

Field coil can be easily damaged and can short out starter. Do not damage insulation when installing pole shoes. Make sure no bare wires are touching field frame. Make sure insulating varnish completely covers field coil and pole shoes.

**NOTE**

If field coil was not removed, go to step 3.

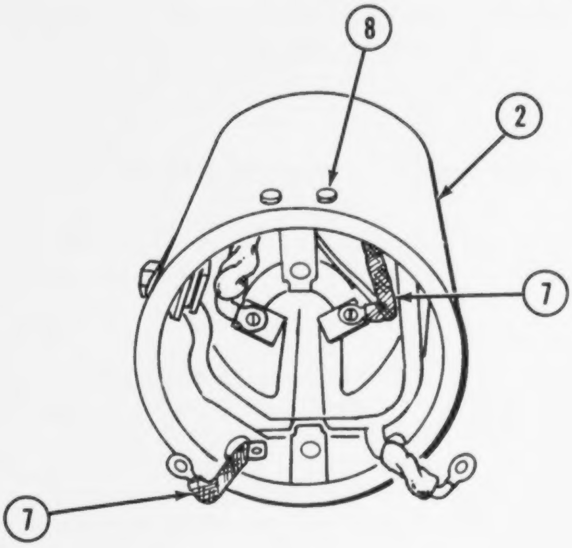
2. INSTALL NEW FIELD COIL ON FIELD FRAME.
   - Install insulation (3), field coil (4), four pole shoes (5), and screws (6) in field frame (2). Use No. 3 cross tip screwdriver.
   - Apply coat of insulating varnish to field coil (4) and pole shoes (5).



**NOTE**

If ground leads were not removed, go to step 4.

3. INSTALL TWO GROUND LEADS ON FIELD FRAME.
   - Install ground leads (7) and two new rivets (8) on field frame (2). Use rivet installing tool.



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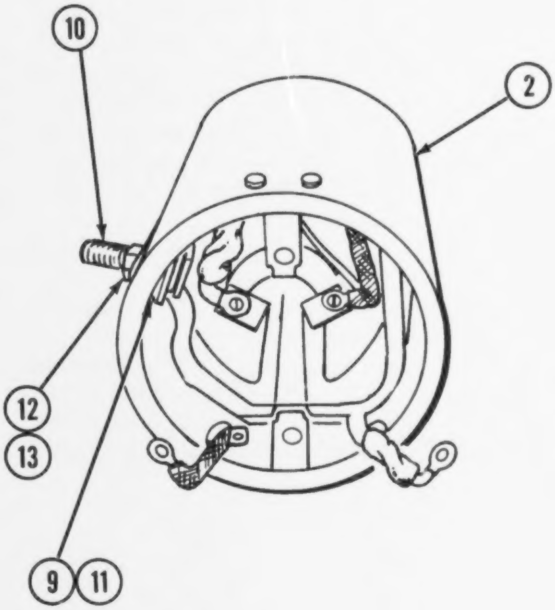
**NOTE**

If terminal stud was not removed, go to step 5.

4. INSTALL TERMINAL STUD ON FIELD FRAME.
   - Install bushing (9) and terminal stud (10) in field frame (2).
   - Install insulated washer (11), washer (12), and nut (13) on terminal stud (10). Use 5/8 inch socket with ratchet.
5. INSTALL ARMATURE IN FIELD FRAME. (SEE STARTER, PAGE 15-145.)
6. INSTALL FOUR BRUSHES ON BRACKETS. (SEE STARTER, PAGE 15-139.)
7. INSTALL COMMUTATOR END FRAME ON STARTER. (SEE STARTER, PAGE 15-140.)
8. INSTALL SOLENOID SWITCH ON STARTER. (SEE STARTER, PAGE 15-132.)
9. INSTALL SWITCH CONNECTOR ON STARTER. (SEE STARTER, PAGE 15-132.)



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END OF TASK

## 15-14 FUEL INJECTION PUMP

### DESCRIPTION

This task covers:
- A. REMOVAL (p 15-162)
- B. PREPARATION OF FUEL INJECTION PUMP FOR INSTALLATION (p 15-172)
- C. INSTALLATION (p 15-173)
- D. ENGINE IDLE SPEED ADJUSTMENT (p 15-183)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
  5180-00-177-7033:
    11/32 inch socket
    7/16 inch socket
    9/16 inch socket
    5/8 inch socket
    7/8 inch socket
    5 inch extension
    6 inch adjustable wrench
    Ratchet handle
    Diagonal cutting pliers
    Slip joint pliers
    1/4 inch flat tip screwdriver
    3/8 inch open end wrench
    5/16 inch open end wrench
    7/16 inch box end wrench
    7/16 inch open end wrench
    1/2 inch open end wrench
    9/16 inch open end wrench
    11/16 inch open end wrench
    3/4 inch open end wrench
1/4 inch drive 1/4 inch socket 5120-00-236-2264
1/4 inch drive ratchet handle 5120-00-221-7957
Cap and plug set 5340-00-450-5178
Soft faced hammer 5120-00-903-8555
Goggles 4240-00-269-7912
Hand held tachometer 6680-00-242-9229
7/16 inch box and open end box wrench
  5120-00-895-9574
3/4 inch drive socket wrench set
  5120-00-204-1999:
    1 5/8 inch socket
    Universal joint
    16 inch extension
    Hinged handle

***Tools and Special Tools — Continued:***

3/8 inch drive torque wrench 5120-00-247-2536
1/2 inch drive torque wrench 5120-00-247-2540
3/8 inch drive 9/16 inch open end
  crowfoot attachment 5120-00-037-5268
Machinist's scriber 5120-00-221-7063

***Materials/Parts:***

Self-locking nut (2) 5310-00-559-0522
Lock washer 5310-00-033-7566
Injector sleeve washer 5310-00-167-9009
Self-locking nut 5310-00-088-1251
Gasket (4) 5330-00-530-2523
Plate gasket 5330-00-231-0283
Safety wire, Item 23, Appendix B
Lock washer 5310-00-011-2724
Cover gasket 5330-00-506-3975
Sealing compound, Item 25, Appendix B
Rags, Item 22, Appendix B

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
BRACKET ASSEMBLY, Page 15-77

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

## OVERVIEW

Fuel lines have fuel in them. Loosen hose couplings and tube nuts slowly. Catch fuel with rags or in suitable container. Wipe up spilled fuel. Dispose of drained fuel according to local procedures.

If you remove or disconnect more than one tube assembly or hose assembly, tag and mark each one. Remove tags after installing or connecting tube assemblies or hose assemblies.

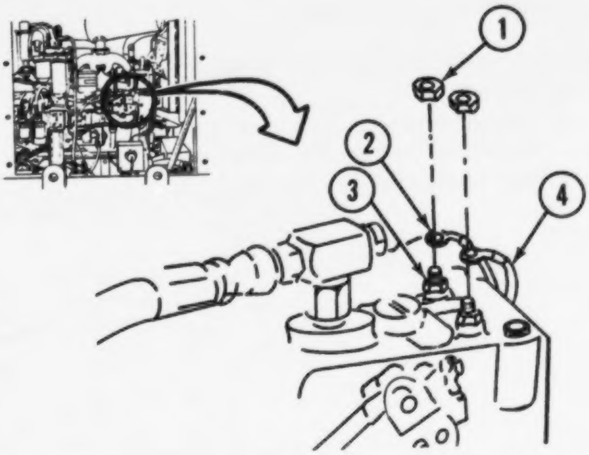
Seal fluid line fittings. Nonflared fittings or fittings without seal, gasket, preformed packing, or other sealing hardware need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

## A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Remove Alternator. (See TM 9-1095-205-20.)
Remove Fan Belt. (See TM 9-1095-205-20.)
Remove Idler Pulley And Bracket. (See Bracket Assembly, Page 15-77.)

1. DISCONNECT LEADS 2 AND 51 FROM FUEL INJECTION PUMP.
   - Remove self-locking nut (1) and Lead 2 (2) from terminal (3). Use 11/32 inch socket with ratchet handle. Discard self-locking nut.
   - Repeat above removal step for Lead 51 (4).



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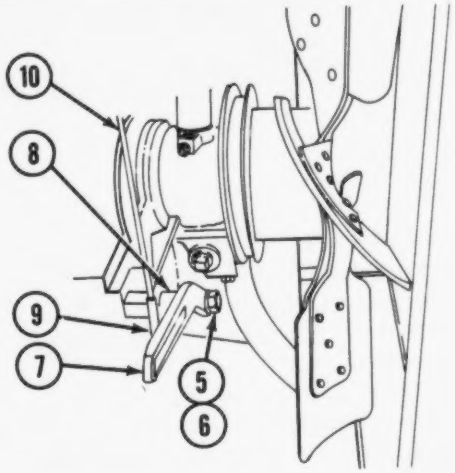
2. REMOVE FRONT LEAKOFF TUBE CLAMP FROM FRONT LEAKOFF TUBE.
   - Remove screw (5), lock washer (6), alternator adjusting strap (7), spacer (8), and clamp (9) with tube (10) from engine. Use 5/8 inch socket with ratchet handle. Discard lock washer.
   - Remove clamp (9) from tube (10).



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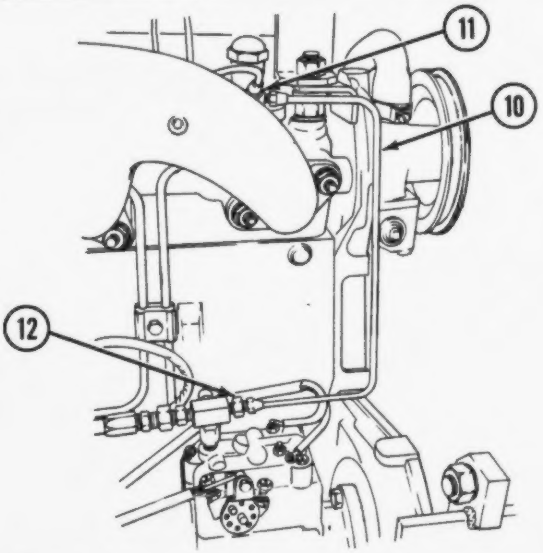
3. REMOVE FRONT LEAKOFF TUBE FROM ENGINE.
   - Disconnect tube (10) from tee (11). Use 7/16 inch box and open end box wrench.
   - Disconnect tube (10) from adapter (12). Use 7/16 inch box and open end box wrench.
   - Plug tube, and cap adapter and tee.
   - Remove tube (10) from engine.



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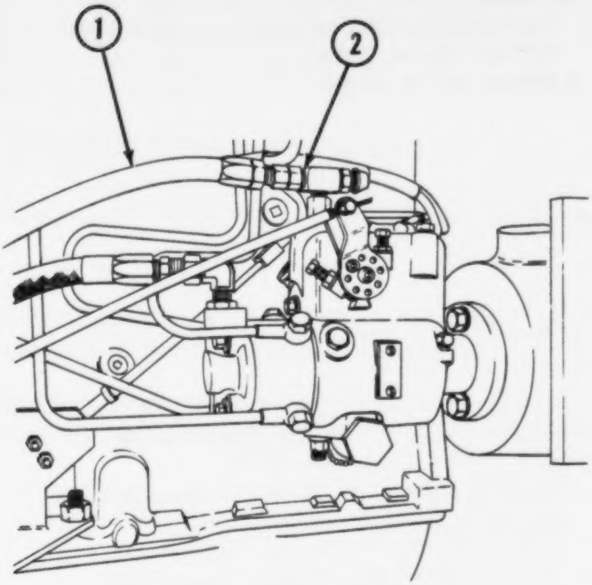
## A. REMOVAL — Continued

4. DISCONNECT LEAKOFF HOSE FROM ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 1/2 inch and 9/16 inch open end wrenches.
   - Plug hose, and cap adapter.



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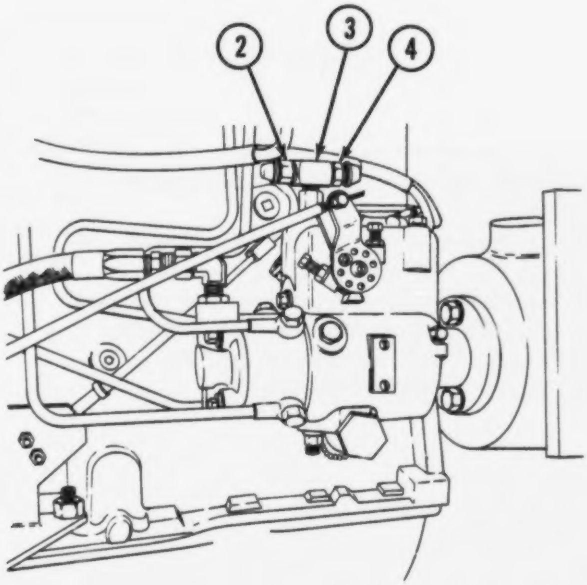
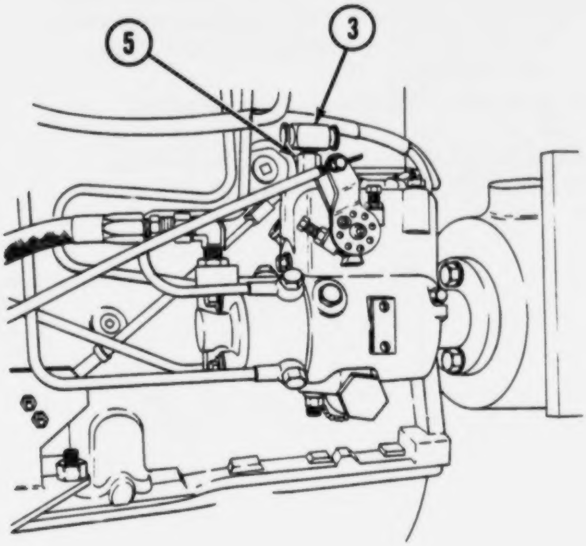
5. REMOVE TWO ADAPTERS FROM TEE.
   - Remove adapter (2) from tee (3). Use 1/2 inch open end and 6 inch adjustable wrenches.
   - Plug tee, and cap adapter.
   - Remove adapter (4) from tee (3). Use 7/16 inch open end and 6 inch adjustable wrenches.
   - Plug tee, and cap adapter.



6. REMOVE TEE FROM ADAPTER.
   - Remove tee (3) from adapter (5). Use 1/2 inch open end and 6 inch adjustable wrenches.
   - Plug adapter, and cap tee.



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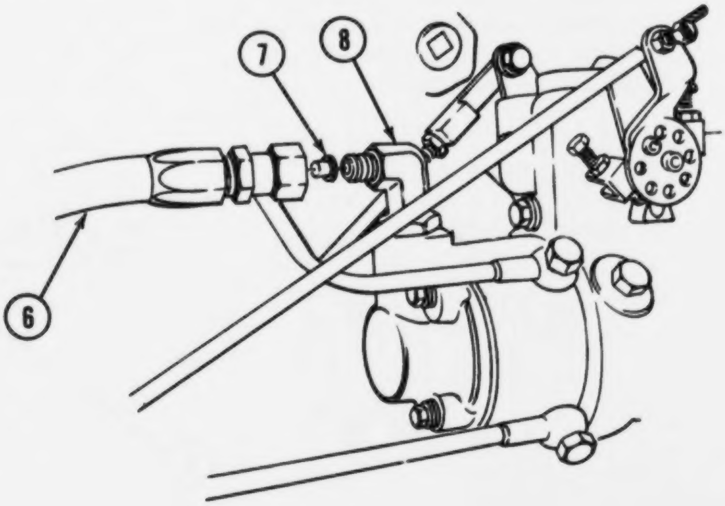
7. DISCONNECT FUEL INLET HOSE FROM FUEL INJECTION PUMP ELBOW.
   - Disconnect hose (6) with eyelet (7) from elbow (8). Use 11/16 inch open end wrench.
   - Remove eyelet (7) from hose (6).
   - Plug hose, and cap elbow.



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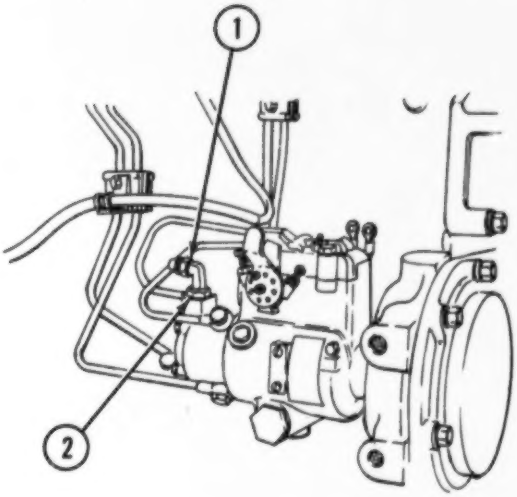
**A. REMOVAL — Continued**

8. REMOVE ELBOW FROM END PLATE SLEEVE.
   - Remove elbow (1) from end plate sleeve (2). Use 6 inch adjustable and 3/4 inch open end wrenches.
   - Plug end plate sleeve, and cap elbow.

9. REMOVE FUEL INJECTION TUBES FROM DISPENSER. (SEE TM 9-1095-205-20.)



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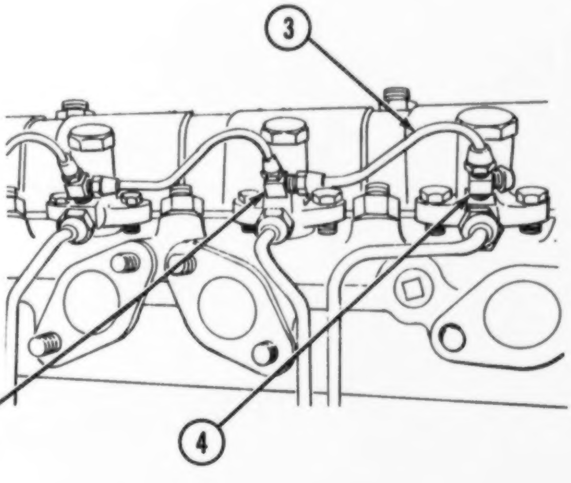
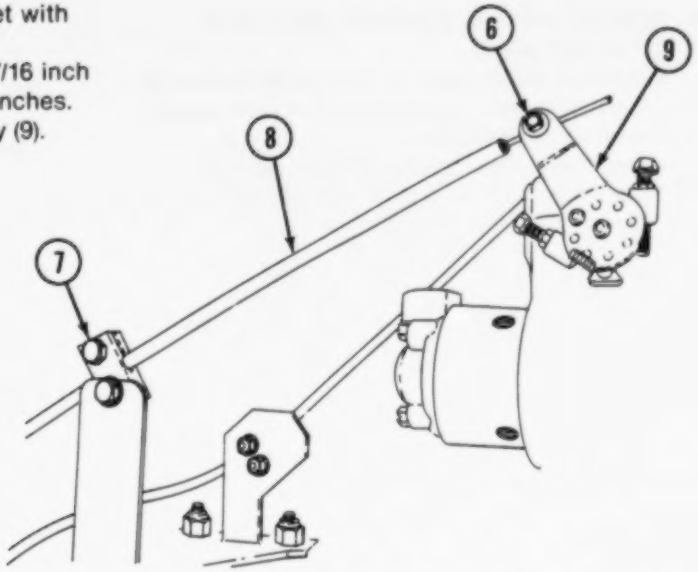
10. REMOVE FRONT TOP LEAKOFF TUBE FROM TWO NOZZLE HOLDERS.
    - Disconnect tube (3) from tee (4). Use 7/16 inch box and open end box wrench.
    - Disconnect tube (3) from tee (5). Use 7/16 inch box and open end box wrench.
    - Plug tube, and cap tees.

11. REMOVE FRONT LIFTING EYE FROM ENGINE. (SEE TM 9-1095-205-20.)



EXHAUST MANIFOLD REMOVED FOR CLARITY

12. REMOVE FUEL CONTROL CABLE FROM ARM ASSEMBLY.
    - Loosen screw (6). Use 1/4 inch socket with 1/4 inch drive ratchet handle.
    - Loosen cable clamp screw (7). Use 7/16 inch box end and 7/16 inch open end wrenches.
    - Remove cable (8) from arm assembly (9).



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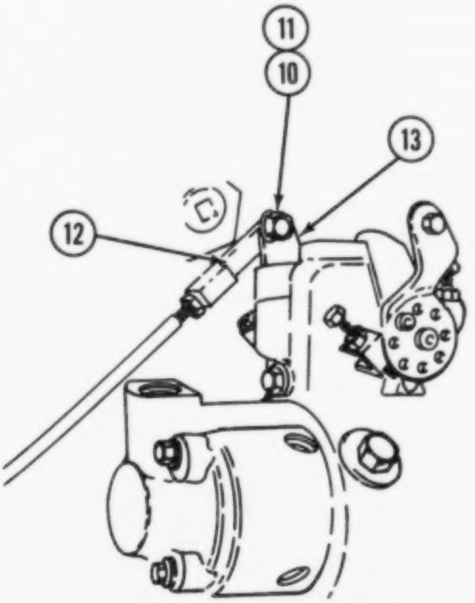
13. REMOVE THROTTLE CABLE FROM THROTTLE ARM.
    - Remove self-locking nut (10), screw (11), and clevis (12) from arm (13). Use 7/16 inch box end wrench and 7/16 inch socket with 5 inch extension and ratchet handle. Discard self-locking nut.



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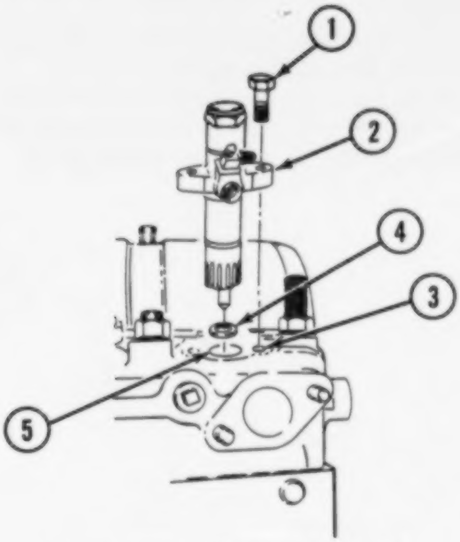
**A. REMOVAL — Continued**

14. REMOVE NO. 1 NOZZLE HOLDER FROM CYLINDER HEAD.
    - Remove two screws (1) and nozzle holder (2) from cylinder head (3). Use 9/16 inch socket with ratchet handle.
    - Remove injector sleeve washer (4) from nozzle bore (5). Use machinist's scriber. Discard washer.



EXHAUST MANIFOLD REMOVED FOR CLARITY

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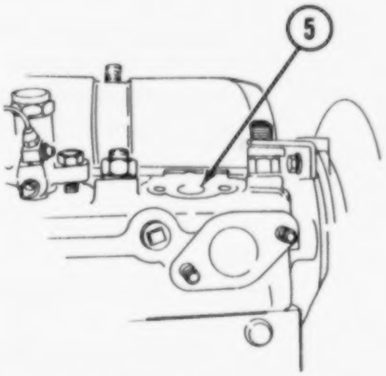
**CAUTION**

Fuel injection pump can be damaged if internal parts are turned the wrong way. Fuel injection pump is designed to be turned to right only. DO NOT turn injection pump drive shaft or crankshaft nut to left.

15. ALINE ENGINE TIMING LINES.
    - Place thumb over nozzle bore (5).
    - Turn crankshaft nut (6) to right until air is forced from nozzle bore (5). Use 1 5/8 inch socket with universal joint, 16 inch extension, and 3/4 inch drive hinged handle. Use helper.



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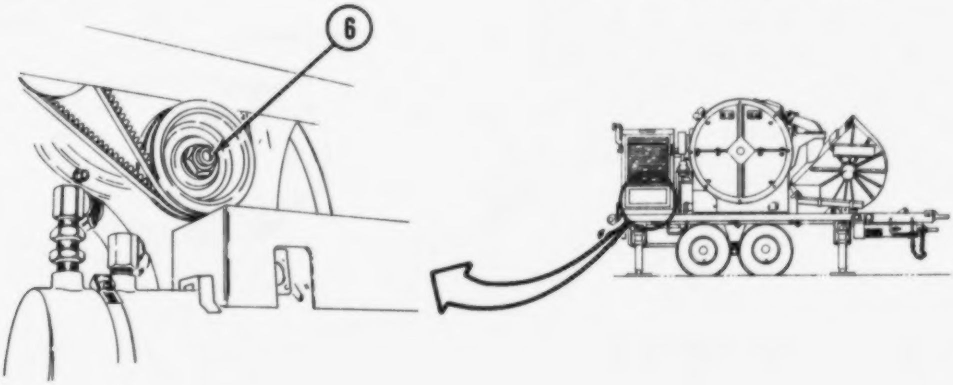
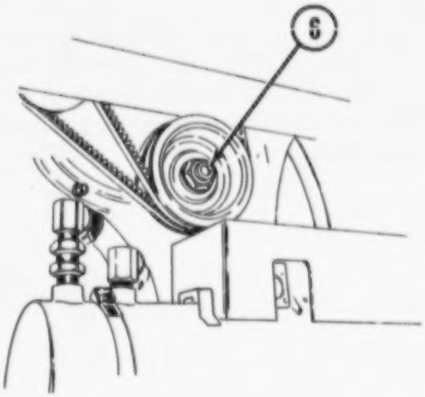
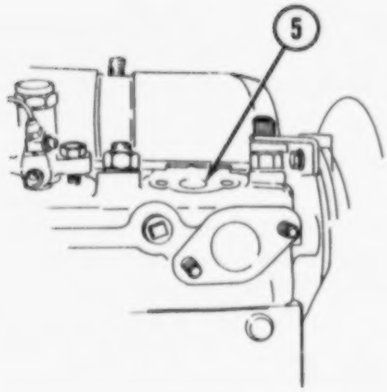


- Turn crankshaft nut (6) to right until 20° flywheel mark (7) is alined with timing line (8) on flywheel housing window (9). Use 1 5/8 inch socket with universal joint, 16 inch extension, and 3/4 inch drive hinged handle. Use helper.
- Plug open nozzle bore (5). Use clean rag.





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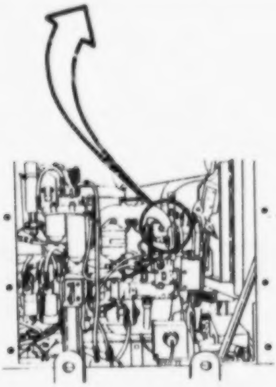

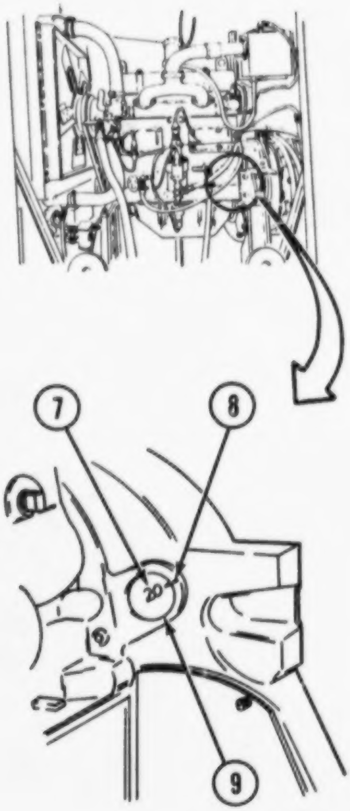

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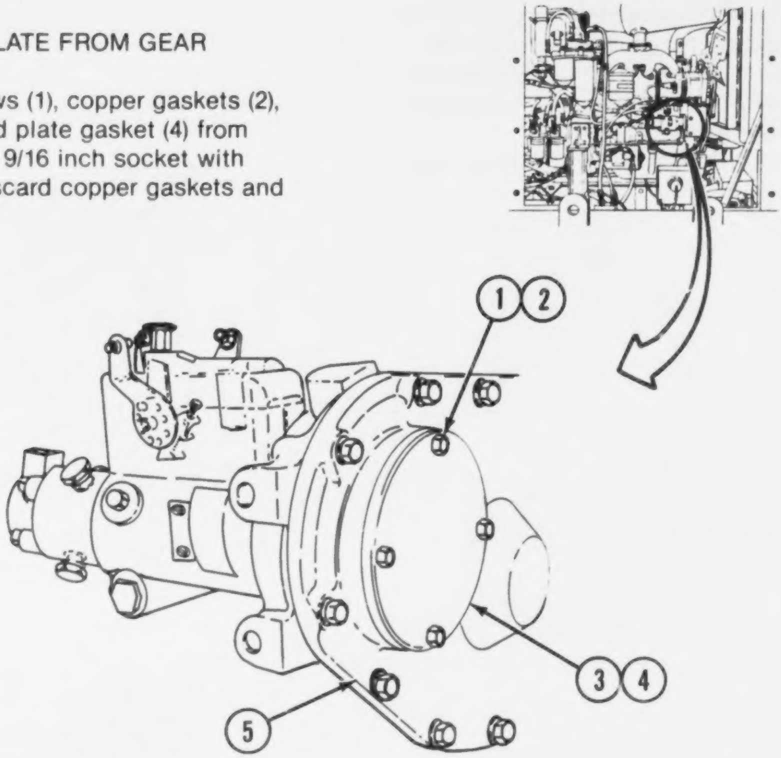
### A. REMOVAL — Continued

16. REMOVE THRUST PLATE FROM GEAR COVER.
    - Remove four screws (1), copper gaskets (2), thrust plate (3), and plate gasket (4) from gear cover (5). Use 9/16 inch socket with ratchet handle. Discard copper gaskets and plate gasket.



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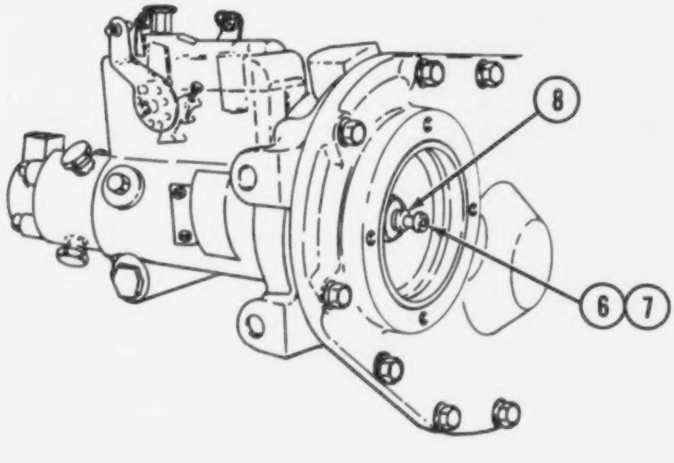
17. REMOVE THRUST PLUG (6) AND SPRING (7) FROM FUEL INJECTION PUMP DRIVE SHAFT (8).

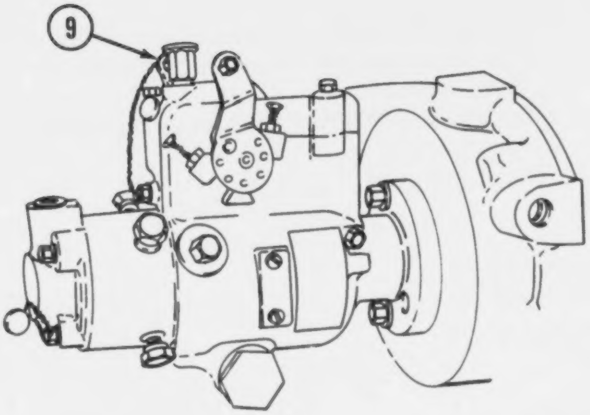


**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

**CAUTION**

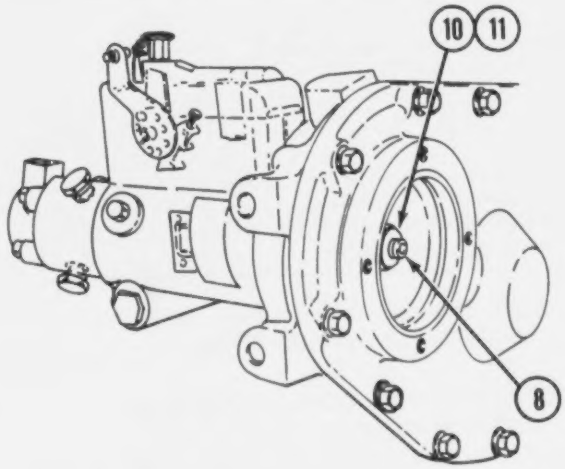
Parts inside fuel injection pump will come loose if throttle is not open. Secure throttle arm open before you remove fuel injection pump.



18. SECURE THROTTLE ARM OPEN.
    - Move arm (9) fully to left.
    - Secure arm (9) fully to left. Use safety wire and slip joint pliers.

---

19. REMOVE FUEL INJECTION PUMP FROM GEAR HOUSING.
    - Remove nut (10) and lock washer (11) from fuel injection pump drive shaft (8). Use 7/8 inch socket with ratchet handie. Discard lock washer.



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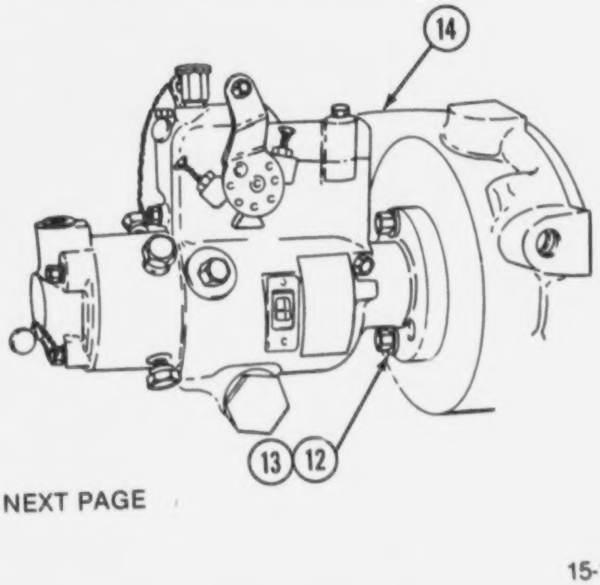
- Remove two screws (12) and washers (13) from gear housing (14). Use 9/16 inch open end wrench.



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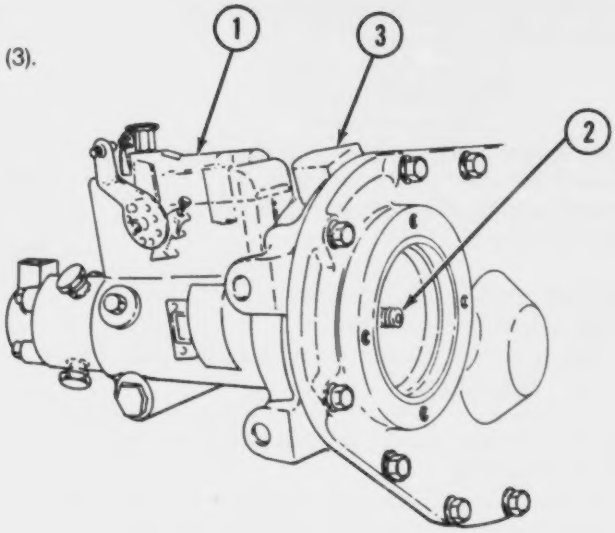
## A. REMOVAL — Continued

- Support fuel pump (1), and tap end of fuel injection pump drive shaft (2). Use soft faced hammer.
- Remove fuel pump (1) from gear housing (3).



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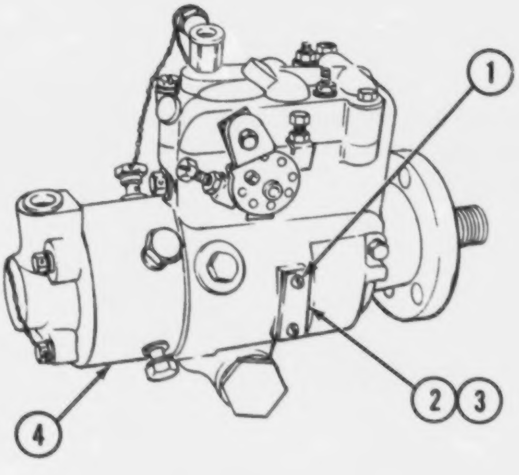
## B. PREPARATION OF FUEL INJECTION PUMP FOR INSTALLATION

1. ALINE ENGINE TIMING LINES. (SEE FUEL INJECTION PUMP, PAGE 15-168.)

2. REMOVE TIMING COVER FROM FUEL INJECTION PUMP.
   - Remove two screws (1), timing cover (2), and cover gasket (3) from fuel pump (4). Use 1/4 inch flat tip screwdriver. Discard gasket.

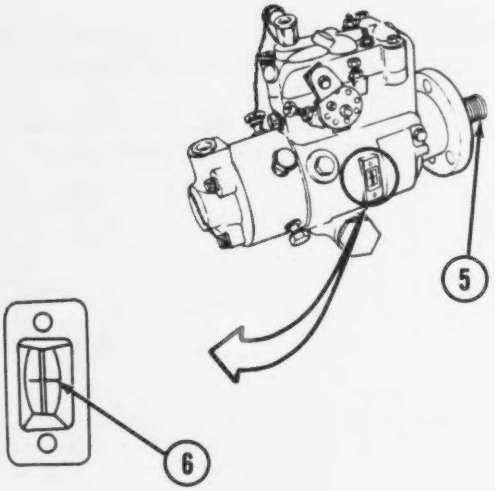


**CAUTION**

Fuel injection pump can be damaged if internal parts are turned the wrong way. Fuel injection pump is designed to be turned to right only. DO NOT turn injection pump drive shaft to left.

3. ALINE FUEL INJECTION PUMP TIMING LINES.
   - Turn pump drive shaft (5) to right until timing lines (6) are alined.

4. INSTALL FUEL INJECTION PUMP ON DISPENSER. (SEE FUEL INJECTION PUMP, PAGE 15-173.)



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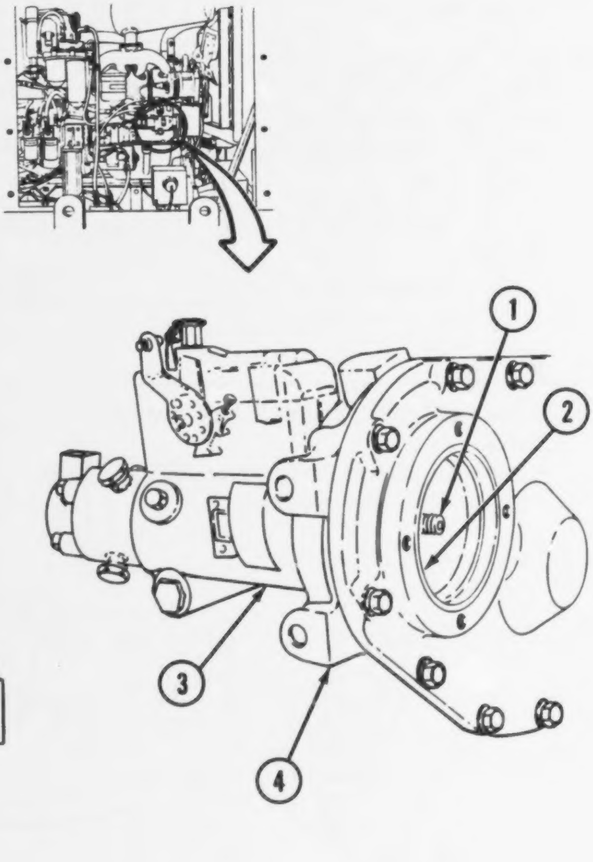
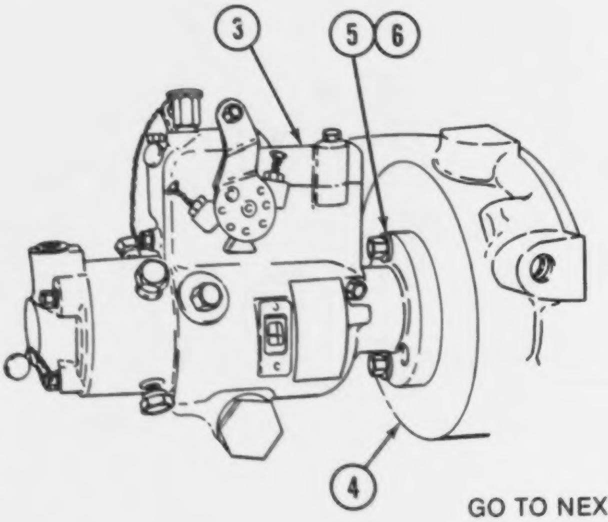
## C. INSTALLATION

1. PREPARE FUEL INJECTION PUMP FOR INSTALLATION. (SEE FUEL INJECTION PUMP, PAGE 15-172.)

2. INSTALL FUEL INJECTION PUMP ON GEAR HOUSING.
   - Insert pump drive shaft (1) through drive gear (2), and place fuel pump (3) on gear housing (4).
   - Install fuel pump (3), two washers (5), and screws (6) on gear housing (4). Do not tighten.





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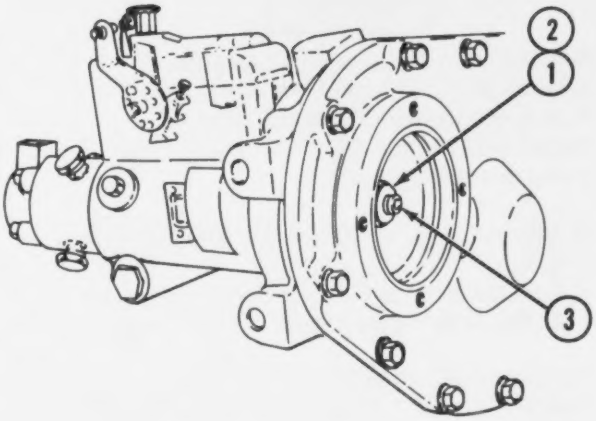
## C. INSTALLATION — Continued

- Install new lock washer (1) and nut (2) on pump drive shaft (3). Use 7/8 inch socket with ratchet handle.
- Torque nut (2) to 65 ft lb (9.0 mkg). Use 7/8 inch socket with 1/2 inch drive torque wrench.



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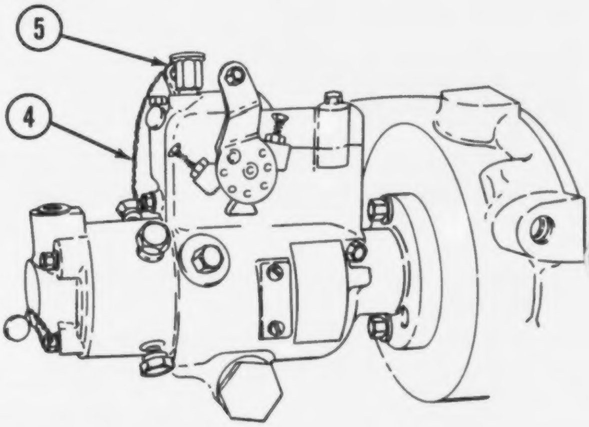
**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

3. CUT AND REMOVE SAFETY WIRE FROM THROTTLE ARM.
   - Cut and remove safety wire (4) from throttle arm (5). Use diagonal cutting pliers. Discard safety wire.



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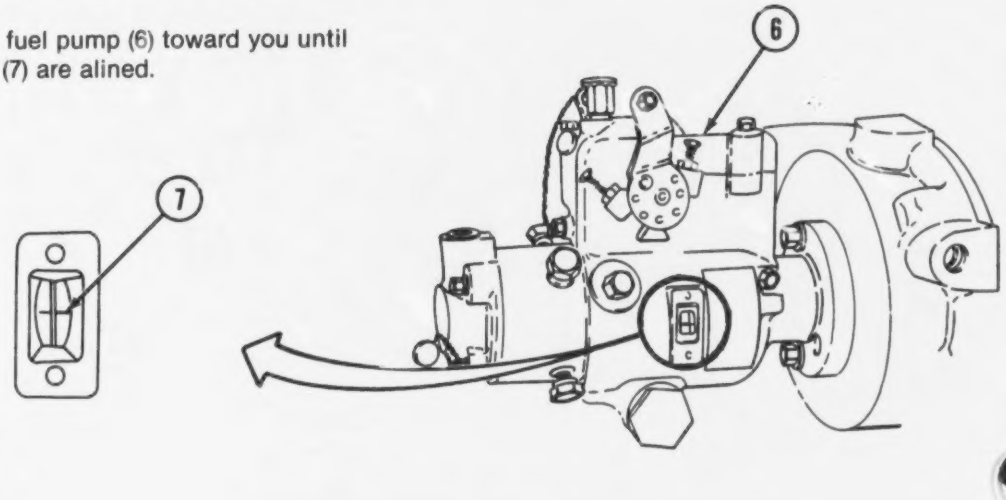
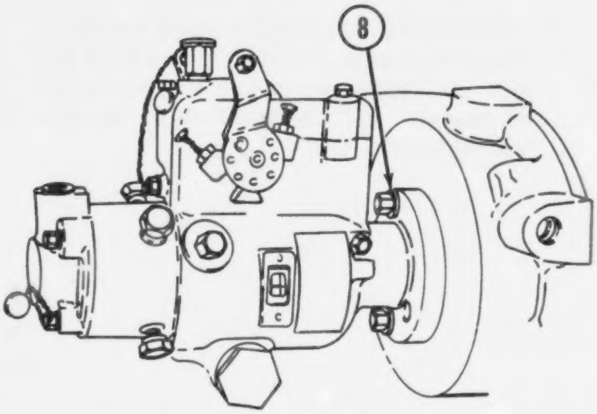
4. ALINE FUEL INJECTION PUMP TIMING LINES.
   - Move top of fuel pump (6) toward you until timing lines (7) are alined.



**NOTE**

Torque wrench dial reading is low when using torque adapter. To apply correct torque, read reference material supplied with torque wrench.

5. TIGHTEN FUEL INJECTION PUMP SCREWS.
   - Torque two screws (8) to 15 ft lb (2.1 mkg). Use 9/16 inch crowfoot attachment with 3/8 inch drive torque wrench.



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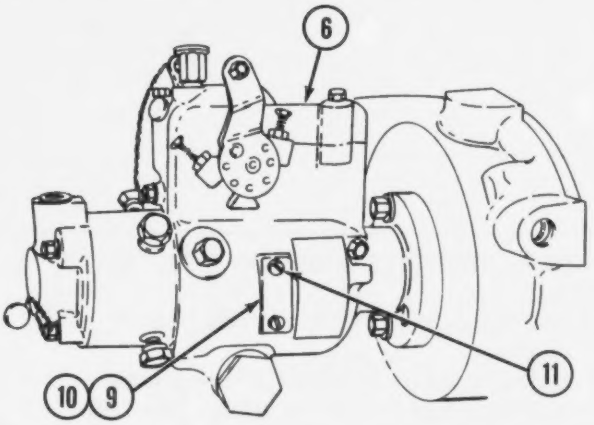
6. INSTALL TIMING COVER ON FUEL INJECTION PUMP.
   - Install new cover gasket (9), cover (10), and two screws (11) on fuel pump (6). Use 1/4 inch flat tip screwdriver.



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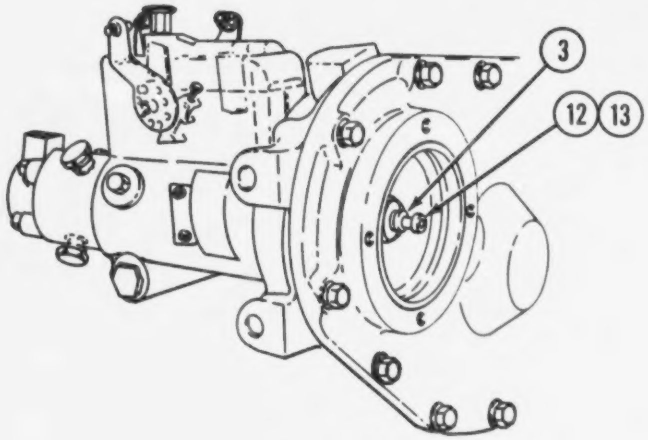
7. INSTALL SPRING (12) AND THRUST PLUG (13) ON FUEL INJECTION PUMP DRIVE SHAFT (3).



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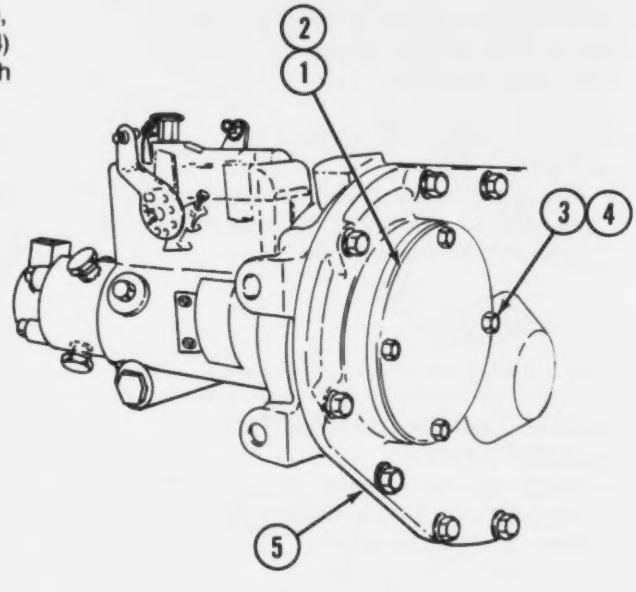
**C. INSTALLATION — Continued**

8. INSTALL THRUST PLATE ON GEAR COVER.
   - Install new plate gasket (1), thrust plate (2), four new copper gaskets (3), and screws (4) on gear cover (5). Use 9/16 inch socket with ratchet handle.



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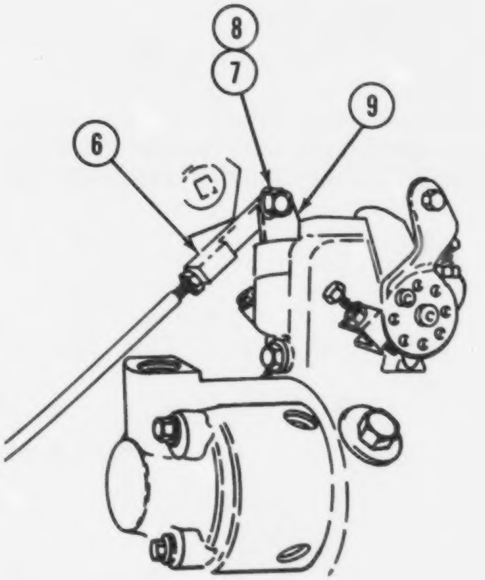
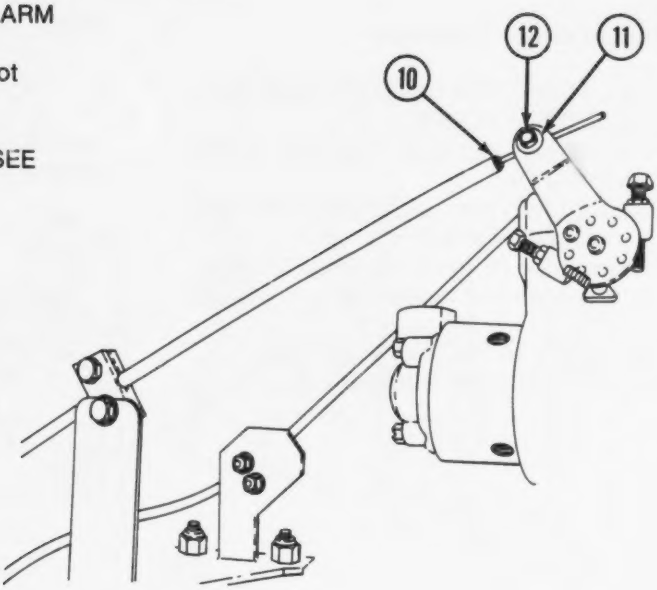
9. INSTALL THROTTLE CABLE ON THROTTLE ARM.
   - Position clevis (6) with long side near engine.
   - Install screw (7), clevis (6), and new self-locking nut (8) on throttle arm (9). Use 7/16 inch open end wrench and 7/16 inch socket with 5 inch extension and ratchet handle. Do not overtighten self-locking nut. Allow clevis to pivot freely.



10. INSTALL FUEL CONTROL CABLE ON ARM ASSEMBLY.
    - Install cable (10) in clamp (11). Do not tighten screw (12).

11. ADJUST FUEL CONTROL LINKAGE. (SEE TM 9-1095-205-20.)



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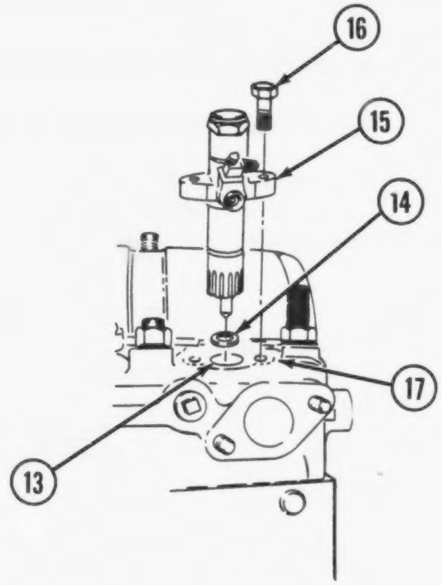
**CAUTION**

Uneven tightening of nozzle holder attachment bolts can damage nozzle holder or nozzle tip. Tighten holder attachment bolts evenly.

12. INSTALL NO. 1 NOZZLE HOLDER ON CYLINDER HEAD.
    - Remove rag from nozzle bore (13).
    - Install new injector sleeve washer (14), nozzle holder (15), and two bolts (16) on cylinder head (17).
    - Torque two bolts (16) to 25 — 30 ft lb (3.5 — 4.2 mkg). Use 9/16 inch socket with 5 inch extension and 1/2 inch drive torque wrench. Torque bolts evenly and in steps.

13. INSTALL FRONT LIFTING EYE ON ENGINE. (SEE TM 9-1095-205-20.)



EXHAUST MANIFOLD REMOVED FOR CLARITY

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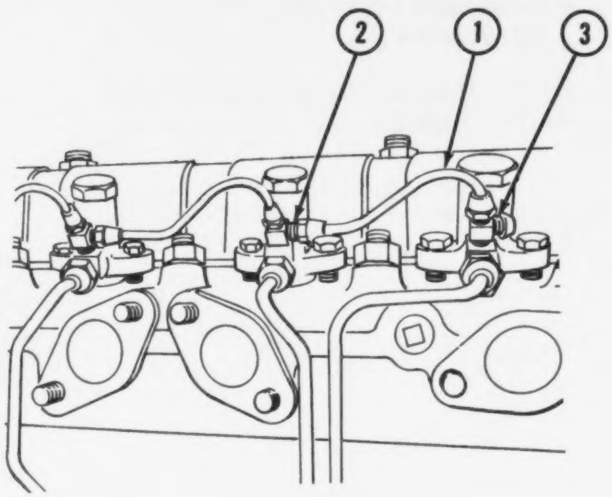
**C. INSTALLATION — Continued**

14. INSTALL FRONT TOP LEAKOFF TUBE ON TWO NOZZLE HOLDERS.
    - Remove plugs and caps from tube (1), tee (2), and tee (3).
    - Connect tube (1) to tee (2). Use 7/16 inch box and open end box wrench.
    - Connect tube (1) to tee (3). Use 7/16 inch box and open end box wrench.

15. INSTALL FUEL INJECTION TUBES ON DISPENSER. (SEE TM 9-1095-205-20.)



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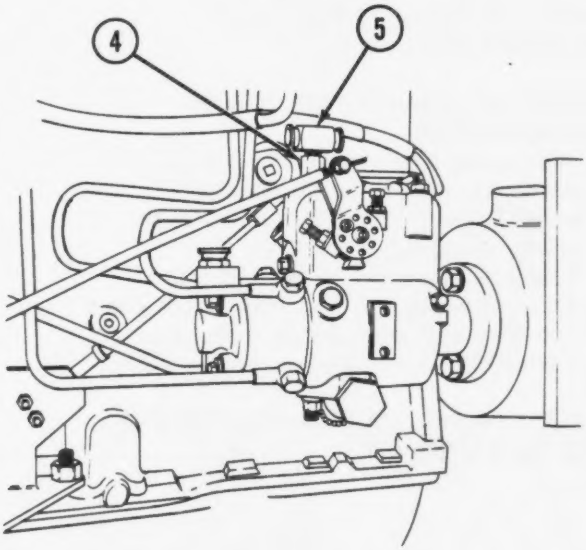
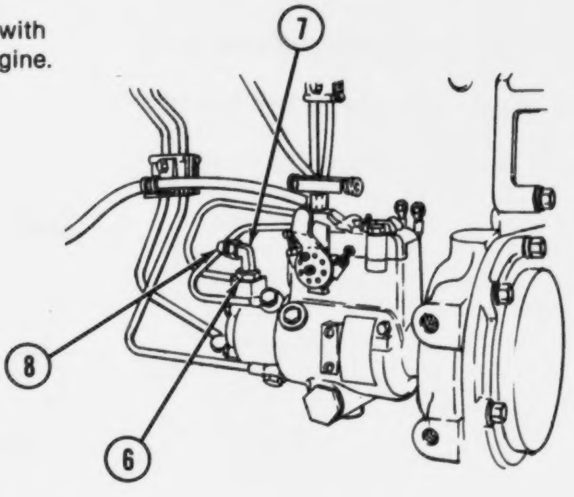
16. INSTALL TEE ON ADAPTER.
    - Remove plug and cap from adapter (4) and tee (5).
    - Apply sealing compound to threads of tee (5).
    - Install tee (5) on adapter (4).
    - Use 1/2 inch open end and 6 inch adjustable wrenches.



17. INSTALL ELBOW ON END PLATE SLEEVE.
    - Remove plug and cap from end plate sleeve (6) and elbow (7).
    - Apply sealing compound to threads of elbow (7).
    - Install elbow (7) on end plate sleeve (6) with elbow opening (8) pointing to rear of engine. Use 6 inch adjustable wrench.



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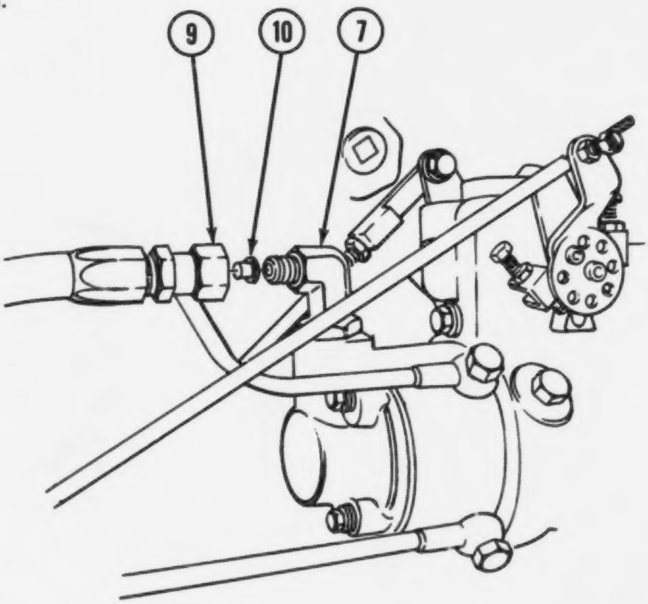
18. CONNECT FUEL INLET HOSE TO FUEL INJECTION PUMP ELBOW.
    - Remove plug and cap from hose (9) and elbow (7).
    - Connect hose (9) with eyelet (10) to elbow (7). Use 11/16 inch open end wrench.



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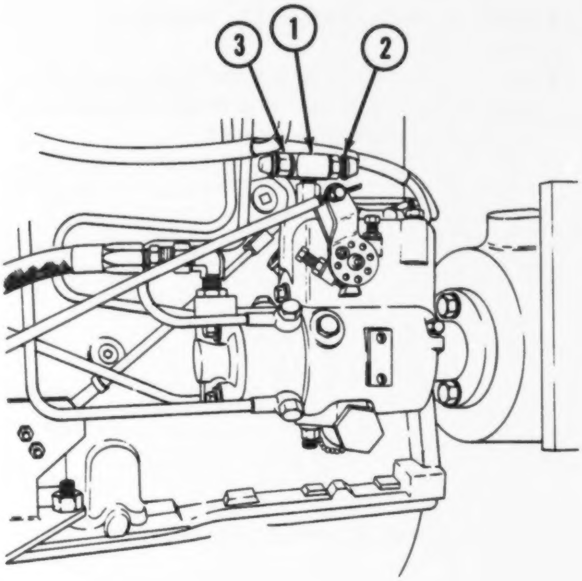
## C. INSTALLATION — Continued

19. INSTALL TWO ADAPTERS ON TEE.
    - Remove plug and cap from tee (1) and adapter (2).
    - Apply sealing compound to threads of adapter (2).
    - Install adapter (2) on tee (1). Use 7/16 inch open end wrench.
    - Remove plug and cap from tee (1) and adapter (3).
    - Apply sealing compound to threads of adapter (3).
    - Install adapter (3) on tee (1). Use 1/2 inch open end wrench.



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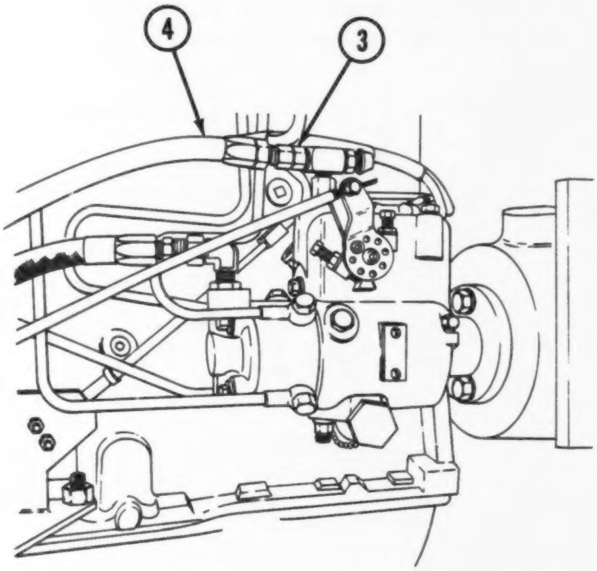
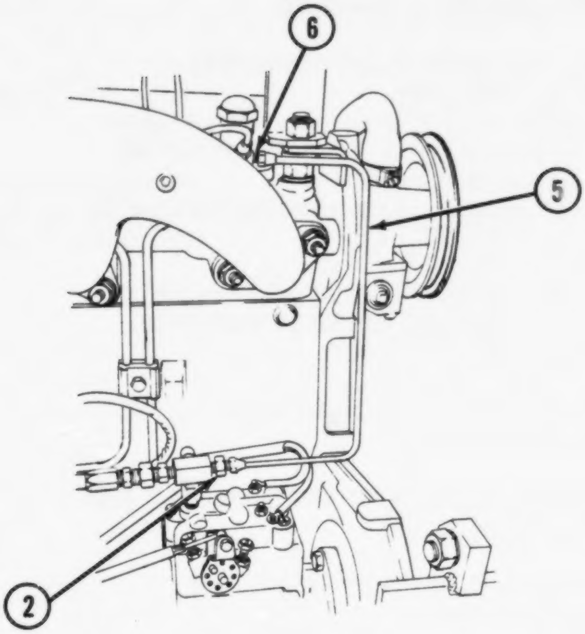
20. CONNECT LEAKOFF HOSE TO ADAPTER.
    - Remove plug and cap from hose (4) and adapter (3).
    - Connect hose (4) to adapter (3). Use 9/16 inch open end wrench.



21. INSTALL FRONT LEAKOFF TUBE ON ENGINE.
    - Remove plugs and caps from tube (5), adapter (2), and tee (6).
    - Connect tube (5) to adapter (2). Use 7/16 inch box and open end box wrench.
    - Connect tube (5) to tee (6). Use 7/16 inch box and open end box wrench.



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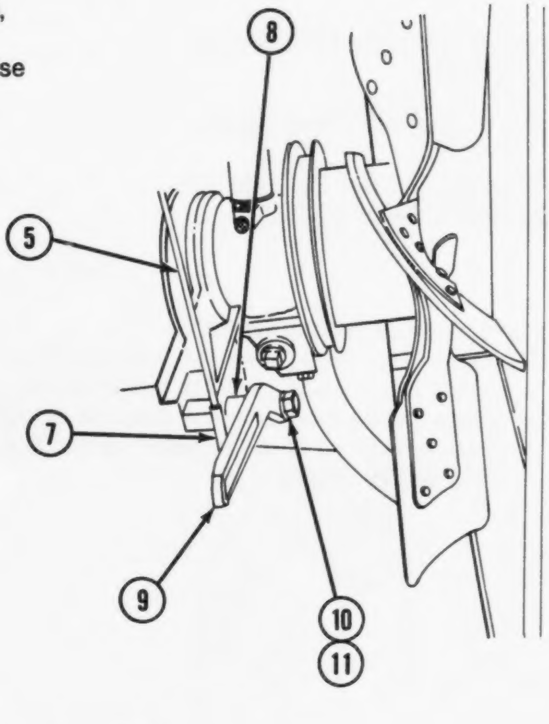
22. INSTALL FRONT LEAKOFF TUBE CLAMP ON FRONT LEAKOFF TUBE.
    - Position clamp (7) on tube (5).
    - Install clamp (7), with tube (5), spacer (8), alternator adjusting strap (9), new lock washer (10), and screw (11) on engine. Use 5/8 inch socket with ratchet handle.



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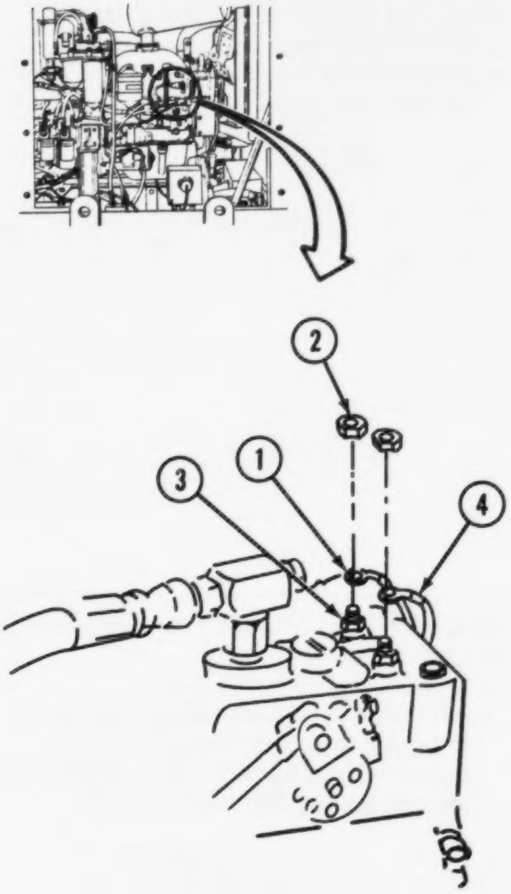
## C. INSTALLATION — Continued



23 INSTALL LEADS 2 AND 51 ON FUEL INJECTION PUMP.
- Install Lead 2 (1) and new self-locking nut (2) on terminal (3). Use 11/32 inch socket with ratchet handle.
- Repeat above installation step for Lead 51 (4).

24. INSTALL IDLER PULLEY AND BRACKET ON DISPENSER. (SEE BRACKET ASSEMBLY, PAGE 15-77.)

25. INSTALL FAN BELT ON DISPENSER. (SEE TM 9-1095-205-20.)

26. INSTALL ALTERNATOR ON DISPENSER. (SEE TM 9-1095-205-20.)

27. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)

28. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

29. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

30. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

31. STOP ENGINE. (SEE TM 9-1095-205-20.)

32. ADJUST ENGINE IDLE SPEED. (SEE FUEL INJECTION PUMP, PAGE 15-183.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

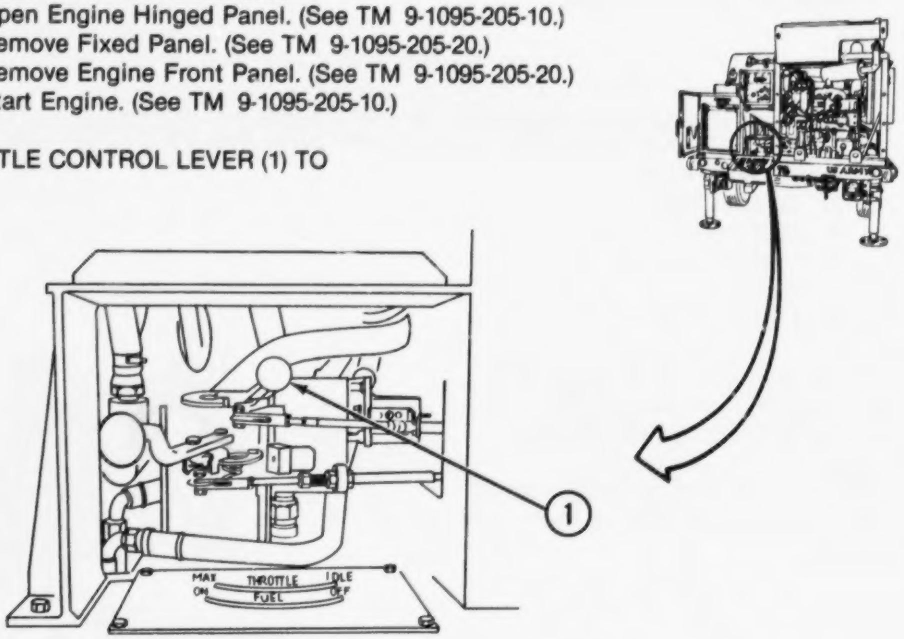
## D. ENGINE IDLE SPEED ADJUSTMENT

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Engine Front Panel. (See TM 9-1095-205-20.)
Start Engine. (See TM 9-1095-205-10.)

1. MOVE THROTTLE CONTROL LEVER (1) TO IDLE.



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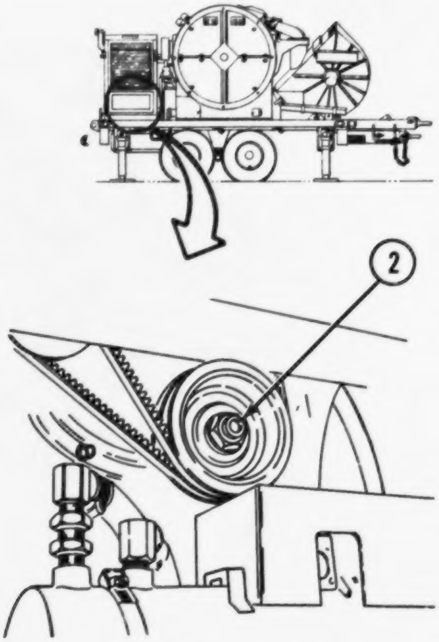
**WARNING**

Engine parts could hurt you. Stay clear of moving parts when engine is running.

2. CHECK ENGINE IDLE SPEED.
   - Check engine idle speed at crankshaft nut (2). Engine idle speed should be 800 — 850 rpm. Use tachometer.
   - Stop engine. (See TM 9-1095-205-20.)
   - If engine idle speed is correct, go to step 6.
   - If engine idle speed is not correct, loosen idle adjust screw locknut. (See next step.)



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## D. ENGINE IDLE SPEED ADJUSTMENT—Continued

**WARNING**

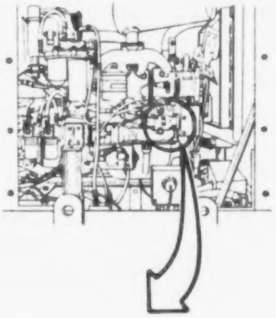
Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

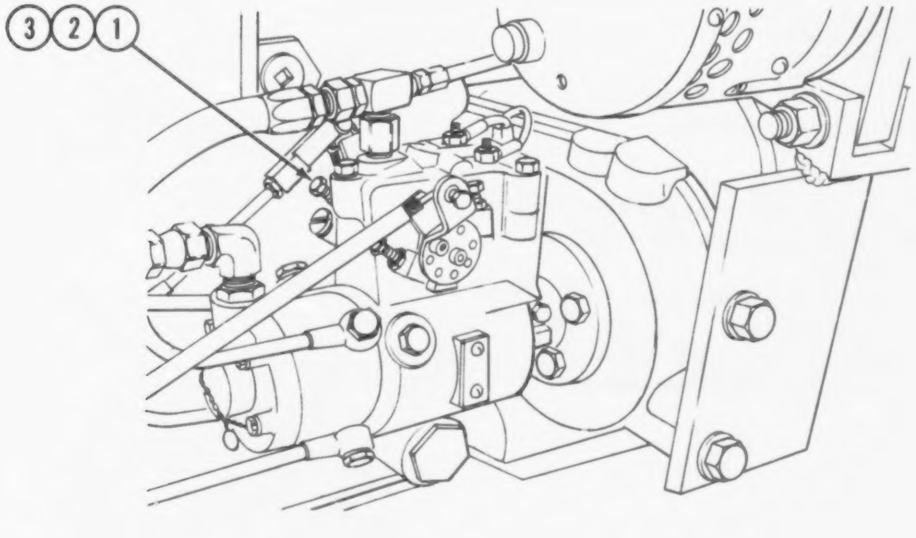
• • • •

Running the engine and operating the dispenser causes many parts to heat up. DON'T TOUCH any of the following parts when they are hot from use.

- Coolant Hoses
- Exhaust Pipe
- Oil Filters
- Hydraulic Pump
- Radiator
- Engine Parts

3. LOOSEN IDLE ADJUST SCREW LOCKNUT.
   - Cut and remove safety wire (1) from screw (2). Use diagonal cutting pliers. Discard safety wire.
   - Hold screw (2), and loosen nut (3). Use 1/4 inch flat tip screwdriver and 3/8 inch open end wrench.

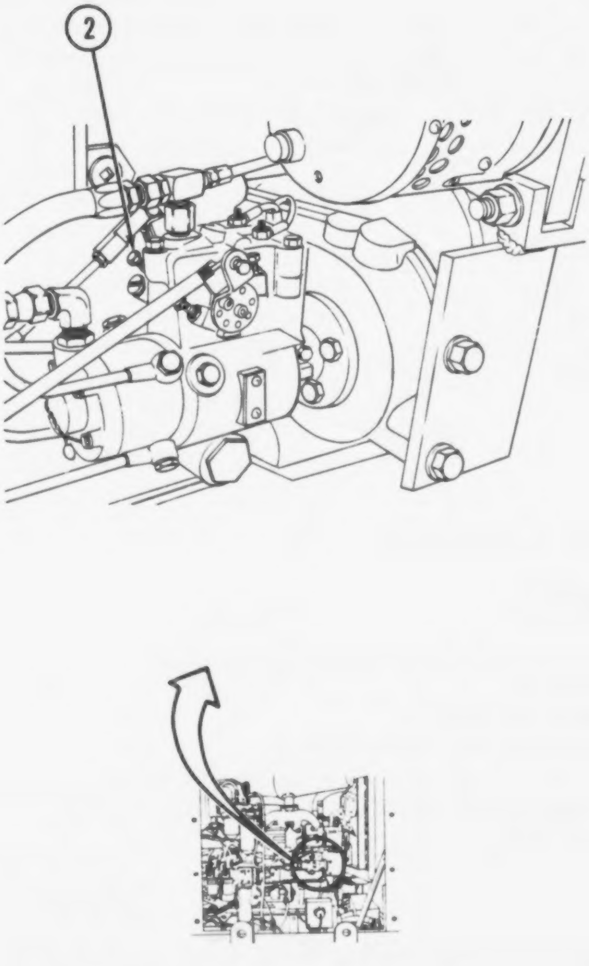


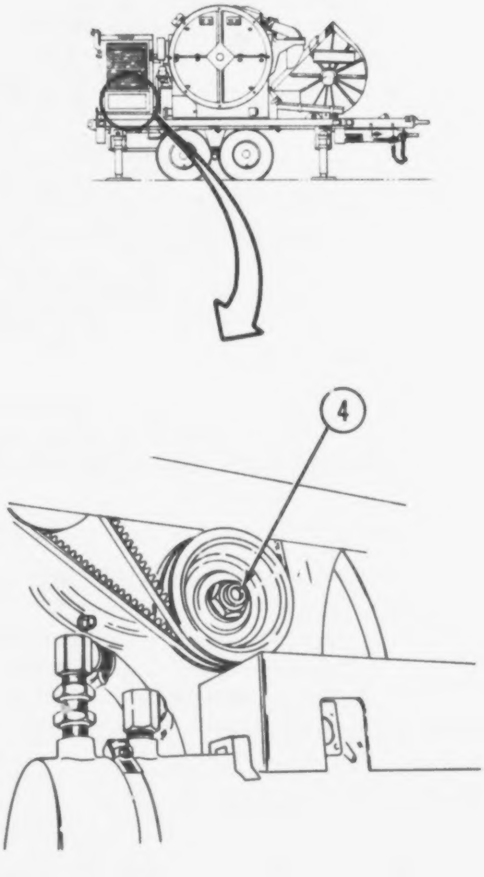


**WARNING**

Engine parts could hurt you. Stay clear of moving parts when engine is running.

4. ADJUST ENGINE IDLE SPEED.
   - Start engine. (See TM 9-1095-205-10.)
   - Move throttle control to IDLE. (See Fuel Injection Pump, Page 15-183.)
   - Have helper check engine idle speed at crankshaft nut (4). Have helper use tachometer. While helper checks idle speed, turn idle adjust screw (2) until engine idle speed is 800 — 850 rpm.
   - Stop engine. (See TM 9-1095-205-20.)





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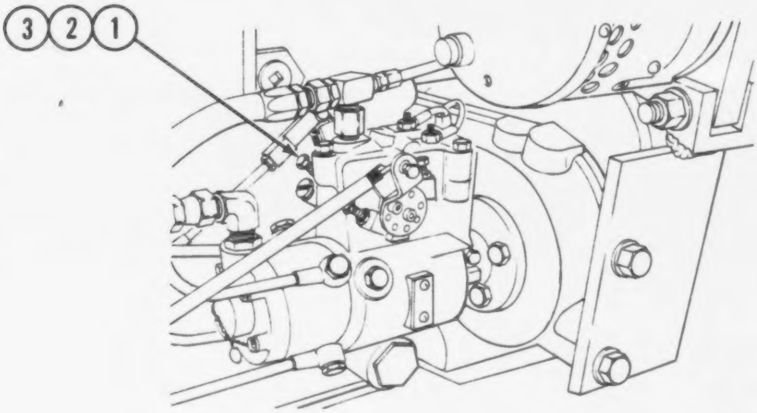
## D. ENGINE IDLE SPEED ADJUSTMENT—Continued

**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

5. TIGHTEN IDLE ADJUST SCREW LOCK NUT.
   - Hold screw (1), and tighten nut (2). Use 1/4 inch flat tip screwdriver and 5/16 inch open end wrench.
   - Install new safety wire (3) on screw (1). Use slip joint pliers.



6. INSTALL FRONT PANEL ON DISPENSER. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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END OF TASK

## 15-15 FUEL NOZZLE ASSEMBLIES

### DESCRIPTION

This task covers:
A. FUEL NOZZLE ASSEMBLY REMOVAL (p 15-189)
B. FUEL NOZZLE ASSEMBLY INSTALLATION (p 15-191)
C. FUEL NOZZLE ASSEMBLY DISASSEMBLY (p 15-193)
D. FUEL NOZZLE ASSEMBLY REASSEMBLY (p 15-194)
E. CYLINDER COMPRESSION TEST (p 15-194)

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### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit 5180-00-177-7033:
  Pry bar
  9/16 inch socket
  11/32 inch socket
  7/16 inch socket
  3/4 inch socket
  5 inch extension
  Ratchet handle
  6 inch adjustable wrench
  7/16 inch box end wrench
  3/4 inch box end wrench
Torque wrench 5120-00-640-6364
Machinist's scriber 5120-00-221-7063
7/16 inch box and open end box wrench 5120-00-895-9568

***Tools and Special Tools — Continued:***

3/4 inch box and open end box wrench 5120-00-895-9573
Machinist vise 5120-00-180-0681
Vise caps 5120-00-221-1506
Cap and plug set 5340-00-450-5718
Cylinder compression tester

***Materials/Parts:***

Injector sleeve washer 5310-00-168-9009
Self-locking nut 5310-00-559-0522
Self-locking nut 5310-00-088-1251

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20

**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

---

### OVERVIEW

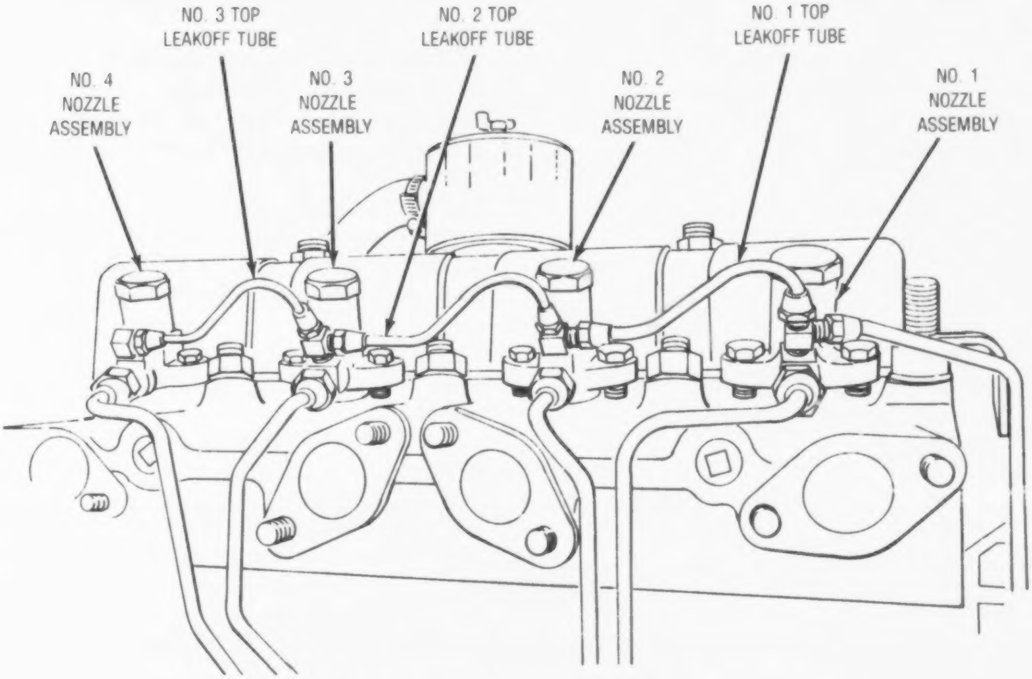
Fuel lines have fuel in them. Loosen tube nuts slowly. Catch fuel with rags or in suitable container. Wipe up spilled fuel. Dispose of drained fuel according to local procedures.

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

If you remove or disconnect more than one tube assembly or hose assembly, tag and mark each one. Remove tags after installing or connecting tube assemblies or hose assemblies.

There are four fuel nozzle assemblies. Removal of any fuel nozzle assembly will require the removal of one or more top fuel leakoff tubes. Each top fuel leakoff tube is removed and installed the same way. Once the necessary tube assemblies are removed, all fuel nozzles are removed and installed the same way. This procedure shows the No. 1 fuel nozzle assembly. See the following Nozzle Assembly and Leakoff Tube Diagram to determine which leakoff tubes to remove for each nozzle assembly.


NO. 3 TOP LEAKOFF TUBE
NO. 2 TOP LEAKOFF TUBE
NO. 1 TOP LEAKOFF TUBE
NO. 4 NOZZLE ASSEMBLY
NO. 3 NOZZLE ASSEMBLY
NO. 2 NOZZLE ASSEMBLY
NO. 1 NOZZLE ASSEMBLY

EXHAUST MANIFOLD REMOVED FOR CLARITY

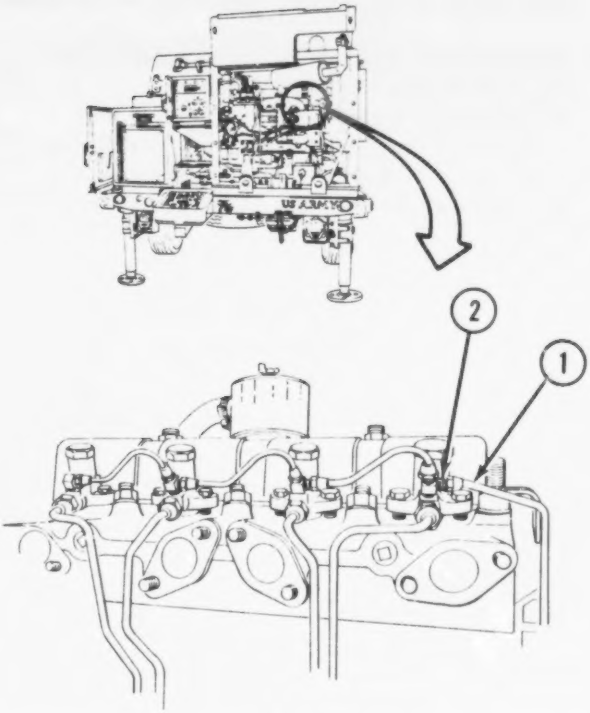
| Remove Fuel Nozzle Assembly | Remove Top Leakoff Tubes |
|---|---|
| 1 | 1 |
| 2 | 1, 2 |
| 3 | 2, 3 |
| 4 | 3 |

*Nozzle Assembly and Leakoff Tube Diagram*

## A. FUEL NOZZLE ASSEMBLY REMOVAL

### NOTE

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Lifting Eyes. (See TM 9-1095-205-20.)



### NOTE

If removing fuel nozzle assemblies 2, 3, or 4, go to step 2.

1. DISCONNECT FRONT LEAKOFF TUBE FROM NO. 1 FUEL NOZZLE ASSEMBLY.
   - Disconnect tube (1) from fitting (2). Use 7/16 inch box and open end box wrench.
   - Plug tube, and cap fitting.

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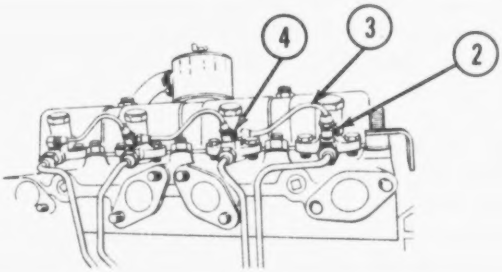

2. REMOVE NO. 1 TOP LEAKOFF TUBE ASSEMBLY FROM ENGINE.
   - Disconnect tube (3) from fitting (2). Use 7/16 inch box and open end box wrench.
   - Disconnect tube (3) from fitting (4), and remove tube from engine. Use 7/16 inch box and open end box wrench.
   - Plug tube, and cap fittings.

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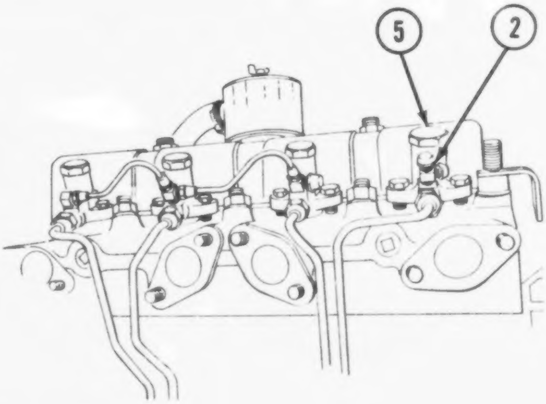
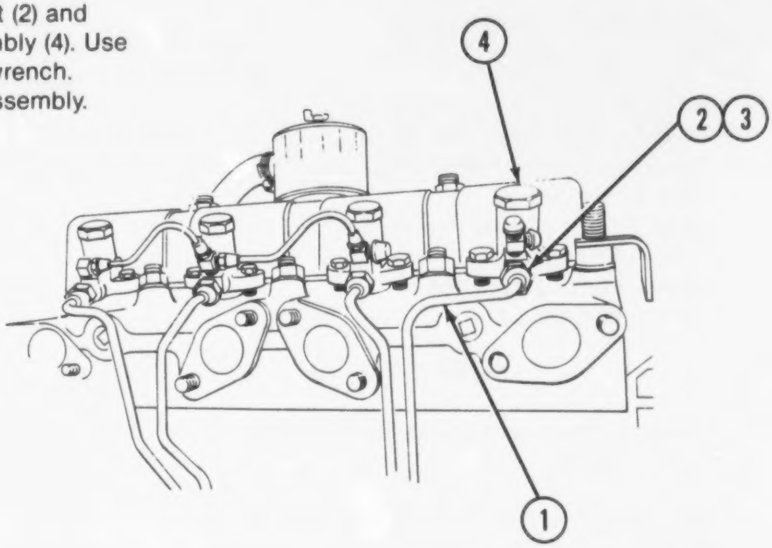


3. REMOVE FUEL LEAKOFF FITTING FROM NO. 1 FUEL NOZZLE ASSEMBLY.
   - Remove fitting (2) from fuel nozzle assembly (5). Use 6 inch adjustable wrench.
   - Plug fuel nozzle assembly, and cap fitting.

GO TO NEXT PAGE

## A. FUEL NOZZLE ASSEMBLY REMOVAL — Continued

4. DISCONNECT FUEL INJECTION TUBE FROM NO. 1 FUEL NOZZLE ASSEMBLY.
   - Disconnect tube (1) with tube nut (2) and ferrule (3) from fuel nozzle assembly (4). Use 3/4 inch box and open end box wrench.
   - Plug tube, and cap fuel nozzle assembly.



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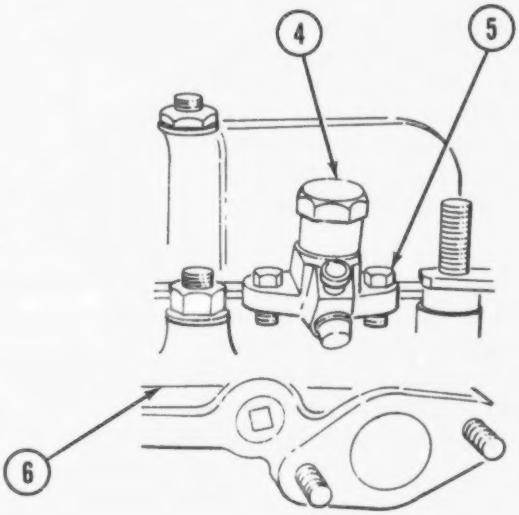
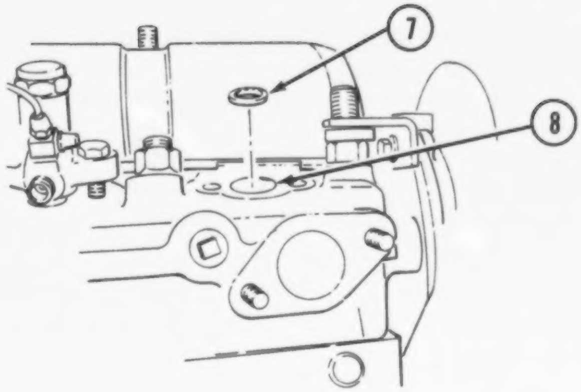
**CAUTION**

Fuel nozzle assembly can be damaged by dirt or by rough handling. Handle assembly carefully, and place on clean surface.

5. REMOVE NO. 1 FUEL NOZZLE ASSEMBLY FROM CYLINDER HEAD.
   - Tag and mark fuel nozzle assembly.
   - Remove two screws (5) and fuel nozzle assembly (4) from cylinder head (6). Use pry bar and 9/16 inch socket with 5 inch extension and ratchet handle.
   - Place fuel nozzle assembly (4) on clean surface.



- Remove injector sleeve washer (7) from nozzle bore (8). Use machinist's scriber. Discard washer.
- Plug cylinder head.



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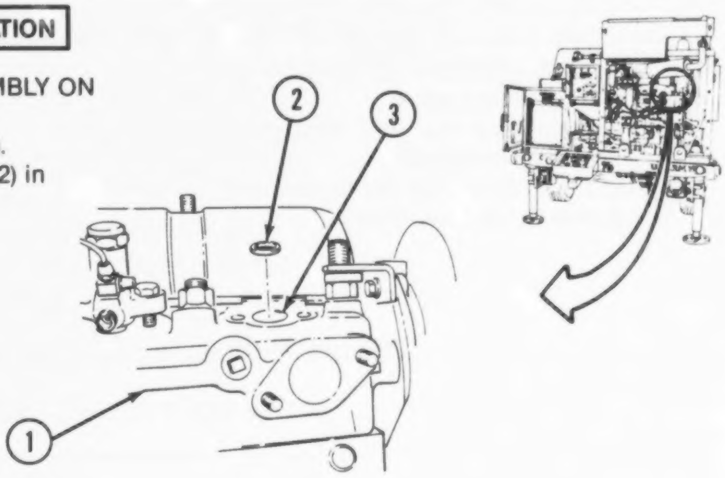
## B. FUEL NOZZLE ASSEMBLY INSTALLATION

1. INSTALL NO. 1 FUEL NOZZLE ASSEMBLY ON CYLINDER HEAD.
   - Remove plug from cylinder head (1).
   - Install new injector sleeve washer (2) in nozzle bore (3).



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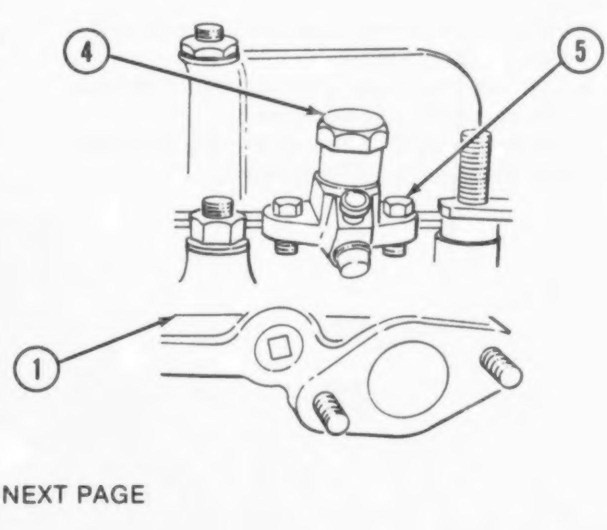
- Install fuel nozzle assembly (4) and two screws (5) on cylinder head (1).
- Torque two screws (5) to 25 — 30 ft lb (3.5 — 4.2 mkg). Use 9/16 inch socket with 5 inch extension and torque wrench.
- Remove tag from fuel nozzle assembly.



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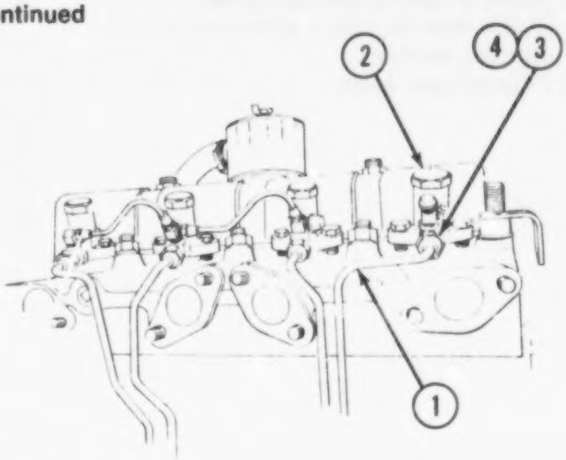
**B. FUEL NOZZLE ASSEMBLY INSTALLATION — Continued**

2. CONNECT FUEL INJECTION TUBE TO NO. 1 FUEL NOZZLE ASSEMBLY.
   - Remove plug and cap from tube (1) and fuel nozzle assembly (2).
   - Connect tube (1) with tube nut (3) and ferrule (4) to fuel nozzle assembly (2). Use 3/4 inch box and open end box wrench.



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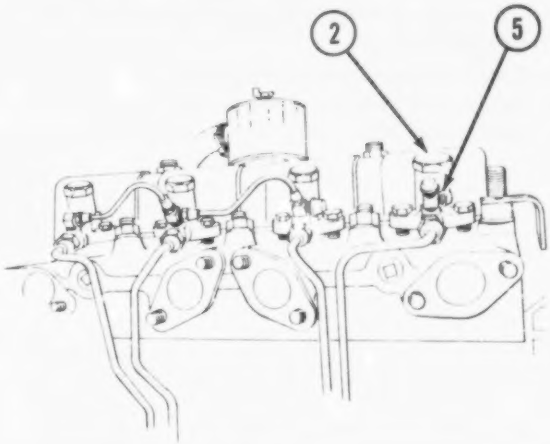
3. INSTALL FUEL LEAKOFF FITTING ON NO. 1 FUEL NOZZLE ASSEMBLY.
   - Remove plug and cap from fitting (5) and fuel nozzle assembly (2).
   - Install fitting (5) on fuel nozzle assembly (2). Use 6 inch adjustable wrench.



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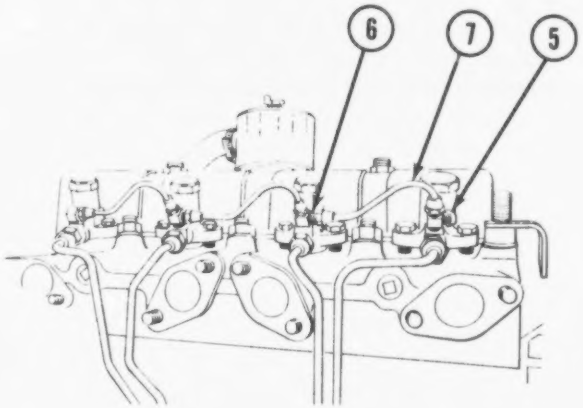
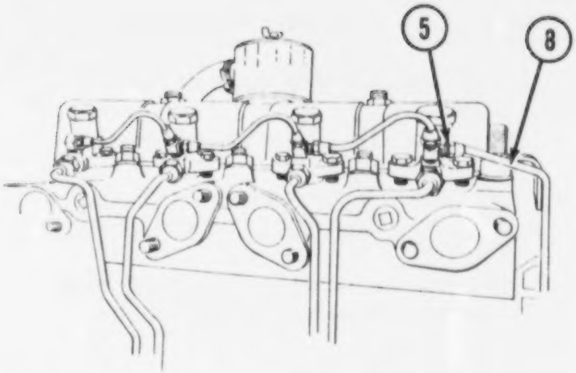
4. INSTALL NO. 1 TOP LEAKOFF TUBE ON ENGINE.
   - Remove plugs and caps from tube (7) and fittings (5) and (6).
   - Connect tube (7) to fitting (6). Use 7/16 inch box and open end box wrench.
   - Connect tube (7) to fitting (5). Use 7/16 inch box and open end box wrench.



**NOTE**

If installing fuel nozzle assemblies 2, 3 or 4, go to step 6.



5. CONNECT FRONT LEAKOFF TUBE TO FUEL NOZZLE ASSEMBLY.
   - Remove plug and cap from tube (8) and fitting (5).
   - Connect tube (8) to fitting (5). Use 7/16 inch box and open end box wrench.
6. INSTALL TWO LIFTING EYES ON ENGINE. (SEE TM 9-1095-205-20.)
7. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)
8. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)
9. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)
10. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.
11. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

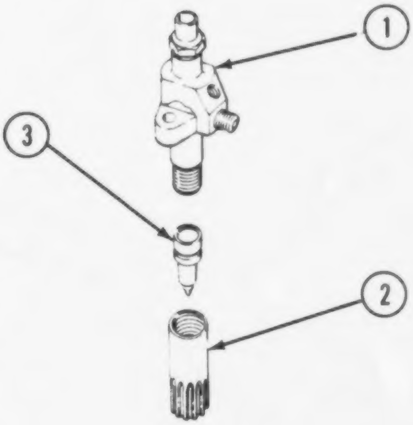
***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

---

## C. FUEL NOZZLE ASSEMBLY DISASSEMBLY

**CAUTION**

Fuel injector nozzle and nozzle holder assembly can be damaged by dirt and rough handling. Handle nozzle and nozzle holder assembly carefully, and place on clean surface.

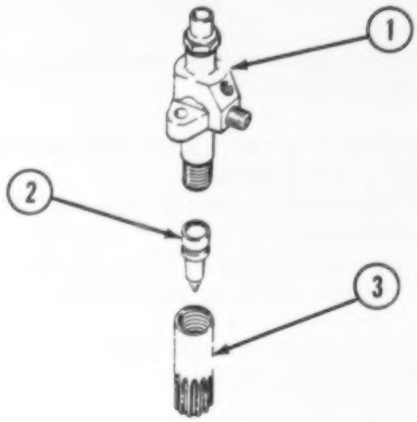


REMOVE FUEL INJECTOR NOZZLE FROM FUEL NOZZLE ASSEMBLY.
- Hold nozzle holder assembly (1). Use vise with vise caps.
- Remove retainer nut (2) and nozzle (3) from nozzle holder assembly (1). Use 3/4 inch box end wrench.
- Place nozzle (3) and nozzle holder assembly (1) on clean surface.

GO TO NEXT PAGE

## 15-15 FUEL NOZZLE ASSEMBLIES — Continued

### D. FUEL NOZZLE ASSEMBLY REASSEMBLY



INSTALL FUEL INJECTOR NOZZLE IN FUEL NOZZLE ASSEMBLY.

- Hold nozzle holder assembly (1). Use vise and vise caps.
- Install nozzle (2) and retainer nut (3) on nozzle holder assembly (1). Use 3/4 inch box end wrench.
- Torque retainer nut (3) to 25 ft lb (3.5 mkg). Use 3/4 inch socket and torque wrench.

---

### E. CYLINDER COMPRESSION TEST

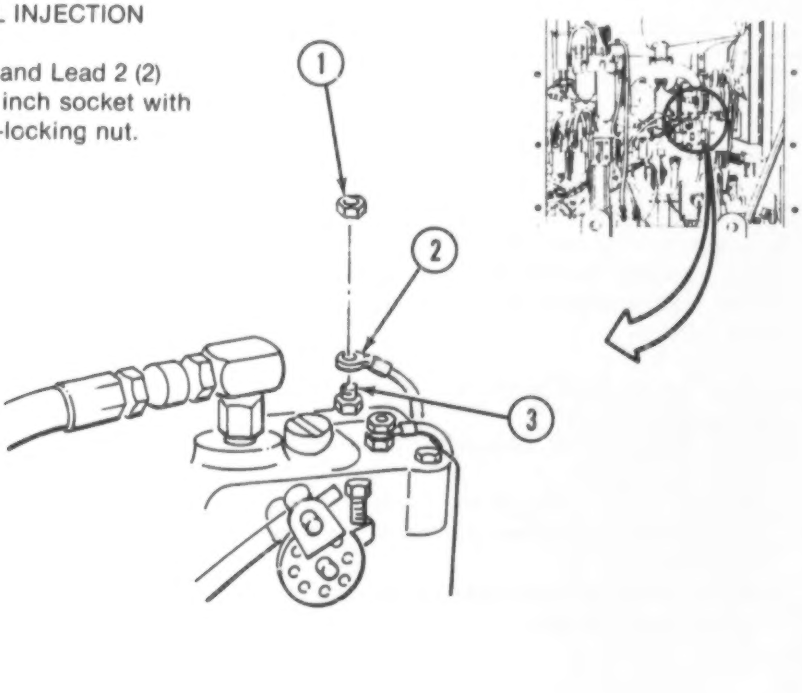
**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Lifting Eyes. (See TM 9-1095-205-20.)

1. REMOVE FOUR FUEL NOZZLE ASSEMBLIES FROM ENGINE. (SEE FUEL NOZZLE ASSEMBLIES, PAGE 15-189.)

2. REMOVE LEAD 2 FROM FUEL INJECTION PUMP.
   - Remove self-locking nut (1) and Lead 2 (2) from terminal (3). Use 11/32 inch socket with ratchet handle. Discard self-locking nut.



3. DISCONNECT CONNECTOR P51 FROM FUEL PUMP RECEPTACLE J51.
   - Remove self-locking nut (4), washer (5), screw (6), and clamp (7) with P51/J51 connection (8) from bracket (9). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard self-locking nut.
   - Remove clamp (7) from P51/J51 connection (8).
   - Disconnect Connector P51 (10) from Receptacle J51 (11).

4. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

5. OPEN MAIN CONTROL PANEL DOOR. (SEE TM 9-1095-205-10.)

6. OPEN BITE PANEL DOOR. (SEE TM 9-1095-205-10.)

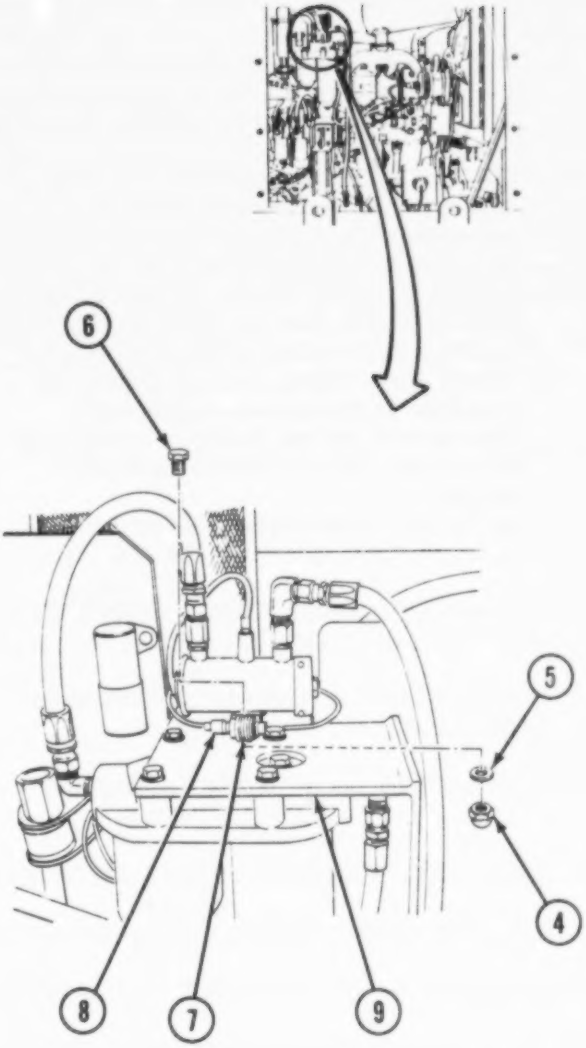
7. LIFT AND SET MASTER POWER SWITCH ON MAIN CONTROL PANEL (MCP) TO ON. (SEE TM 9-1095-205-10.)

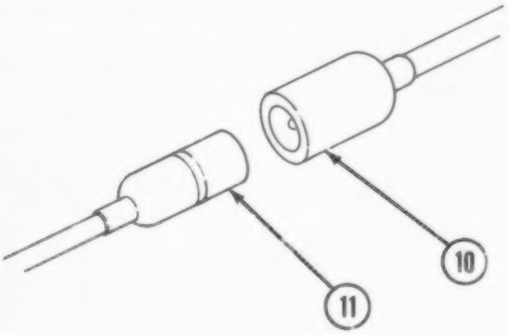
8. TURN ON MAIN POWER CIRCUIT BREAKER S2 ON B.I.T.E./ALARM CONTROL PANEL (BACP). (SEE TM 9-1095-205-10.)

9. TURN ON ELEC POWER CIRCUIT BREAKER S3 ON BACP. (SEE TM 9-1095-205-10.)

10. TURN ON GAUGES CIRCUIT BREAKER S4 ON BACP. (SEE TM 9-1095-205-10.)

11. TURN ON SENSOR/VALVES CIRCUIT BREAKER S5 ON BACP. (SEE TM 9-1095-205-10.)





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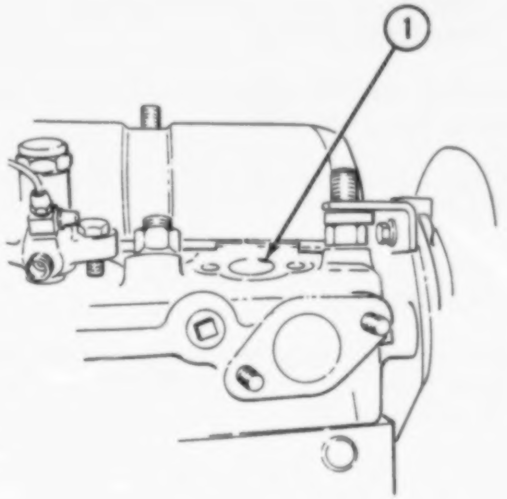
## E. CYLINDER COMPRESSION TEST—Continued

**CAUTION**

Continued cranking of starter motor will cause overheating and failure of starter motor. Do not crank starter motor more than 15 seconds. Allow 1 minute between cranking periods for starter to cool.

12. TEST CYLINDER COMPRESSION.
    - Install cylinder compression tester on nozzle bore (1).
    - Move and hold ENGINE START/FUEL ON/OFF switch on operator control panel (OCP) to START. (See TM 9-1095-205-10.)
    - Record cylinder compression. Use helper.
    - Repeat above testing steps for other three cylinders. Compression should not vary more than 10 percent among all cylinders or be less than 375 psi (2583.6 kPa) in any cylinder.
    - Set ENGINE START/FUEL ON/OFF switch on OCP to OFF. (See TM 9-1095-205-10.)



13. LIFT AND SET MASTER POWER SWITCH ON MCP TO OFF (SEE TM 9-1095-205-10.)

14. TURN OFF MAIN POWER CIRCUIT BREAKER S2 ON BACP. (SEE TM 9-1095-205-10.)

15. TURN OFF ELEC POWER CIRCUIT BREAKER S3 ON BACP. (SEE TM 9-1095-205-10.)

16. TURN OFF GAUGES CIRCUIT BREAKER S4 ON BACP. (SEE TM 9-1095-205-10.)

17. TURN OFF SENSOR/VALVES CIRCUIT BREAKER S5 ON BACP. (SEE TM 9-1095-205-10.)

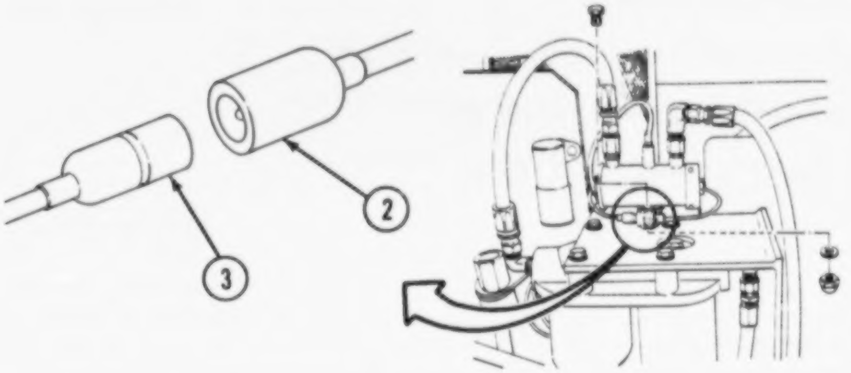
18. CLOSE BITE PANEL DOOR. (SEE TM 9-1095-205-10.)

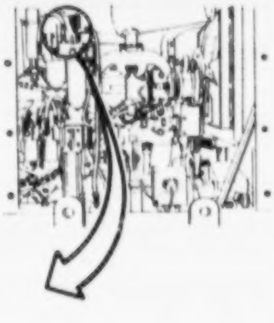
19. CLOSE MAIN CONTROL PANEL DOOR. (SEE TM 9-1095-205-10.)

20. REMOVE NEGATIVE LEAD FROM NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

21. INSTALL FOUR FUEL NOZZLE ASSEMBLIES ON CYLINDER HEAD. (SEE FUEL NOZZLE ASSEMBLIES, PAGE 15-191.)

22. CONNECT CONNECTOR P51 (2) TO FUEL PUMP RECEPTACLE J51 (3).





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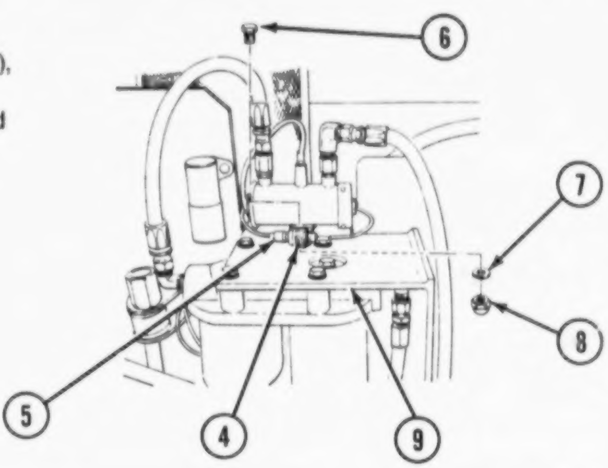
23. INSTALL P51/J51 CONNECTION AND CLAMP ON BRACKET.
    - Install clamp (4) on P51/J51 connection (5).
    - Install clamp (4) with P51/J51 connection (5), screw (6), washer (7), and new self-locking nut (8) on bracket (9). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle.



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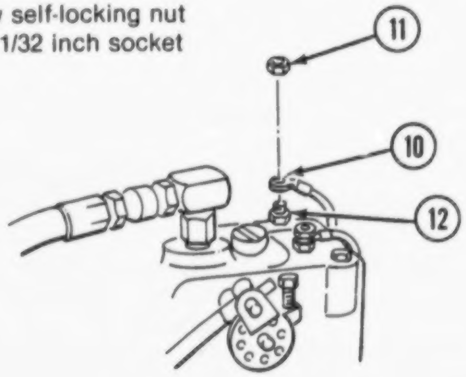
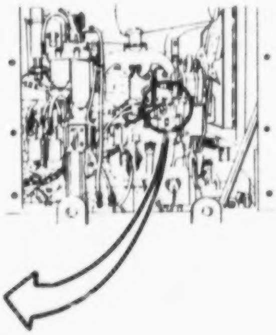
24. INSTALL LEAD 2 ON FUEL INJECTION PUMP.
    - Install Lead 2 (10) and new self-locking nut (11) on terminal (12). Use 11/32 inch socket with ratchet handle.





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**E. CYLINDER COMPRESSION TEST—Continued**

25. INSTALL TWO LIFTING EYES ON ENGINE. (SEE TM 9-1095-205-20.)

26. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)

27. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

28. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

29. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

30. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-16 ROCKER ARM ASSEMBLY

### DESCRIPTION

This task covers:
- A. REMOVAL (p 15-199)
- B. DISASSEMBLY (p 15-200)
- C. INSPECTION (p 15-202)
- D. REASSEMBLY (p 15-203)
- E. INSTALLATION (p 15-208)
- F. ADJUSTMENT (p 15-210)

### INITIAL SETUP

*Tools and Special Tools:*

- General mechanic's tool kit 5180-00-177-7033:
  - 15/16 inch socket
  - Ratchet handle
  - 3/4 inch diameter drive pin punch
  - Center punch
  - 1 inch diameter drive pin punch
  - Thickness gage
  - 1/2 inch open end wrench
- 1/2 inch drive 7/8 inch deep socket 5120-00-243-7342
- 3/4 inch drive hinged handle 5120-00-709-4072
- 3/4 inch drive 16 inch extension 5120-00-227-8079
- 3/4 inch drive 1 5/8 inch socket 5120-00-199-7765
- 3/8 inch drive torque wrench 5120-00-541-3001
- 3/8 inch drive 5 inch extension 5120-00-273-9203
- 3/8 inch drive 1/2 inch socket 5120-00-237-0977
- 1/2 inch drive torque wrench 5120-00-640-6364

*Tools and Special Tools — Continued:*

- Hand oiler 4930-00-275-7900
- Vernier caliper 5120-00-293-2913
- Micrometer 5120-00-540-2973
- Machinist's vise 5120-00-180-0681
- Retaining ring pliers 5120-00-288-9717
- Vise caps 5120-00-221-1506
- Soft faced hammer 5120-00-903-8555

*Materials/Parts:*

- Lubricating oil (see LO 9-1095-205-12), Item 16, Appendix B
- Crocus cloth, Item 4, Appendix B
- Retaining ring (2) 5365-00-191-3976
- Shaft plug (2) 5340-00-623-1725

*Personnel Required:*

- Mechanic
- Helper

*References:*

- LO 9-1095-205-12
- TM 9-1095-205-10
- TM 9-1095-205-20
- EXHAUST MANIFOLD, Page 15-23

### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Engine Hinged Panel. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Cylinder Head Valve Cover. (See TM 9-1095-205-20.)
Remove Exhaust Manifold. (See Exhaust Manifold, Page 15-23.)

GO TO NEXT PAGE

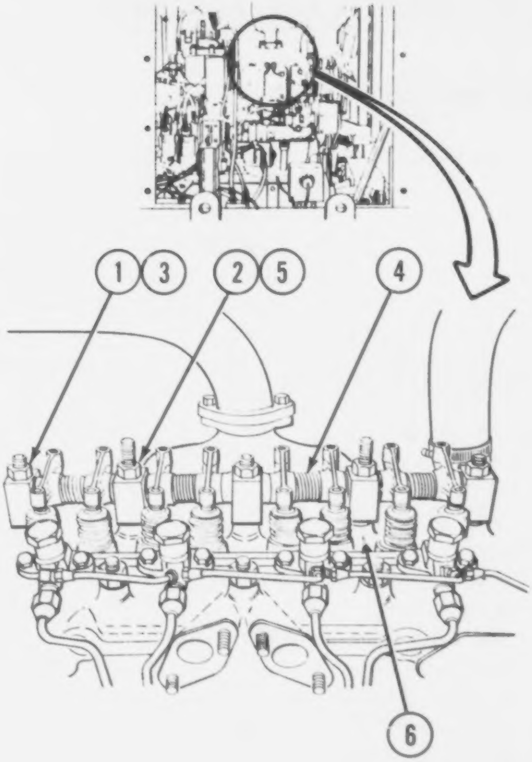
**A. REMOVAL — Continued**

**NOTE**

Nuts must be loosened before removal, to relieve pressure on valve springs.

REMOVE ROCKER ARM ASSEMBLY FROM CYLINDER HEAD.

- Loosen nut (1). Use 15/16 inch socket with ratchet handle.
- Loosen four nuts (2). Use 7/8 inch deep socket with ratchet handle.
- Remove nut (1) and washer (3) from rocker arm assembly (4). Use 15/16 inch socket with ratchet handle.
- Remove four nuts (2) and washers (5) from rocker arm asembly (4). Use 7/8 inch deep socket with ratchet handle.
- Remove rocker arm assembly (4) from cylinder head (6).



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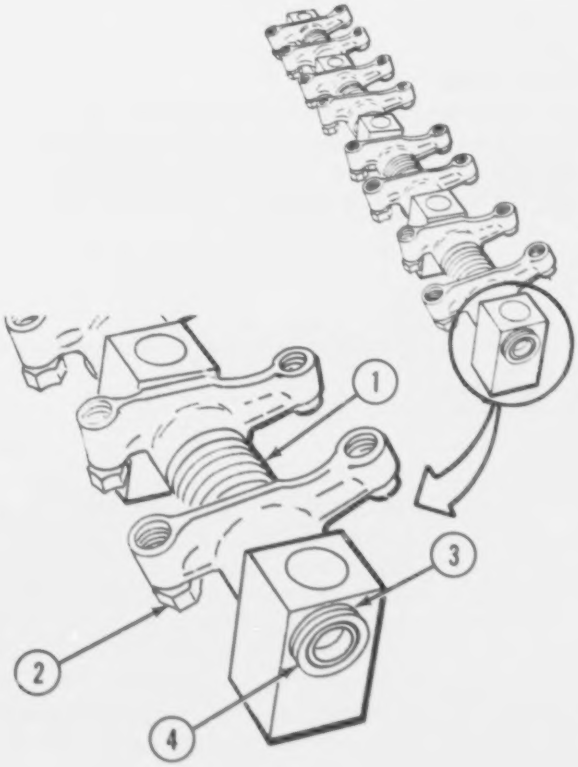
## B. DISASSEMBLY

**NOTE**

Disassemble rocker arm assembly with rocker arm adjusting screws toward you.

1. REMOVE RETAINING RING FROM ROCKER ARM SHAFT.
   - Position rocker arm assembly (1) with eight adjusting screws (2) toward you.
   - Remove retaining ring (3) from shaft (4). Use retaining ring pliers. Discard retaining ring.



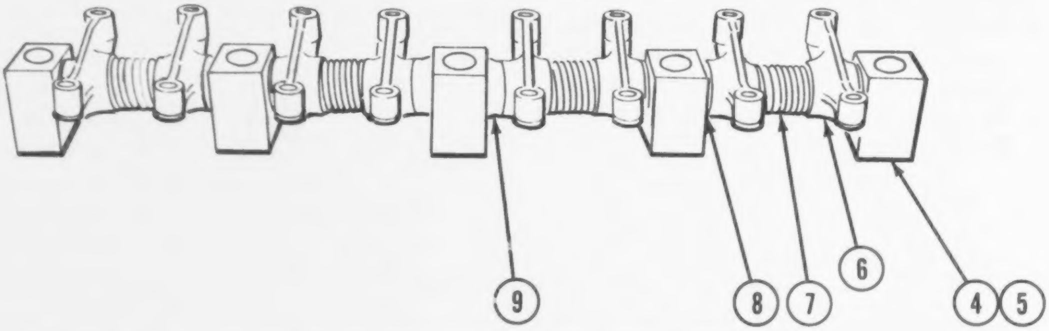
**WARNING**

Holes in rocker arm shaft have sharp edges that can hurt you. Be careful when you handle rocker arm shaft.

**NOTE**

Rocker arms and rocker arm shaft supports must be installed in positions from which they are removed. Keep rocker arms and rocker arm shaft supports in order. Tag and mark each rocker arm and rocker arm shaft support when each is removed from shaft.

2. REMOVE ROCKER ARMS FROM ROCKER ARM SHAFT.
   - Remove five shaft supports (5), eight rocker arms (6), four springs (7), nine thin spacers (8), and two thick spacers (9) from shaft (4).



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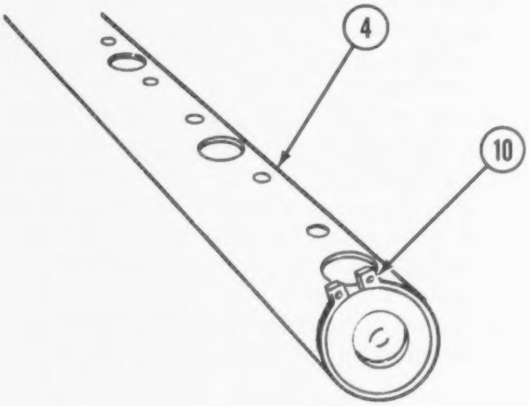
3. REMOVE RETAINING RING FROM ROCKER ARM SHAFT.
   - Remove retaining ring (10) from shaft (4). Use retaining ring pliers. Discard retaining ring.



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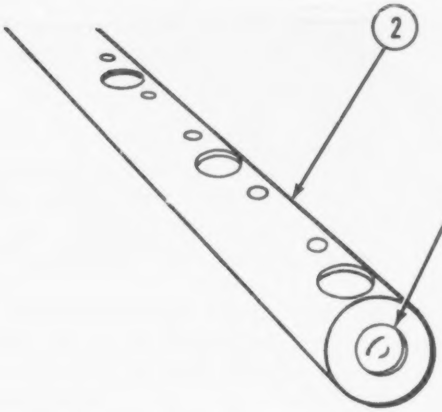
## B. DISASSEMBLY — Continued

### NOTE

Do not remove shaft plugs unless damaged.

4. REMOVE TWO SHAFT PLUGS FROM ROCKER ARM SHAFT.
   - Remove two shaft plugs (1) from shaft (2). Use 3/4 inch diameter drive pin punch and soft faced hammer. Discard shaft plugs.



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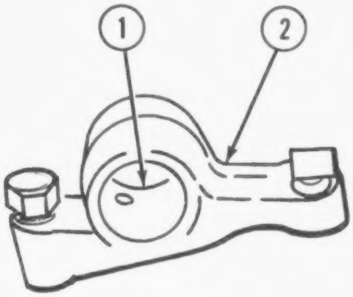
## C. INSPECTION

1. MEASURE ROCKER ARM SHAFT BORES IN EIGHT ROCKER ARMS.
   - Measure shaft bore (1) in rocker arm (2). Use vernier caliper. If shaft bore is more than 0.867 in. (22.02 mm), rocker arm is faulty.
   - Repeat above measuring step for other seven rocker arms.



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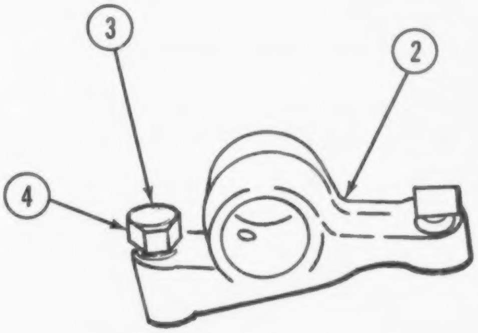
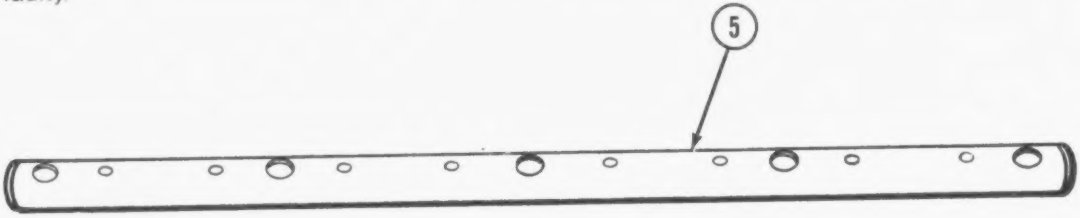
2. INSPECT EIGHT ROCKER ARM ADJUSTING SCREWS.
   - Inspect adjusting screw cup (3) for flat bottom, scratches, or wear. If adjusting screw cup has flat bottom, scratches, or is worn, screw is faulty.
   - Hold rocker arm (2) with adjusting screw cup (3) facing up. Use vise with vise caps.
   - Turn screw (4). Use 1/2 inch socket with 3/8 inch drive torque wrench. Screw must need at least 3 ft lb (0.4 mkg) to turn. If screw needs less than 3 ft lb (0.4 mkg) to turn, screw is faulty.
   - Repeat above inspection steps for other seven rocker arm adjusting screws.



**WARNING**

Holes in rocker arm shaft have sharp edges that can hurt you. Be careful when you handle rocker arm shaft.

3. INSPECT ROCKER ARM SHAFT.
   - Inspect shaft (5) for shoulders or ridges. If shaft has shoulders or ridges, shaft is faulty.
   - Polish scratches in shaft (5). Use crocus cloth.
   - Measure diameter of shaft (5). Use micrometer. If diameter is less than 0.856 in. (21.74 mm), shaft is faulty.



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## D. REASSEMBLY

**WARNING**

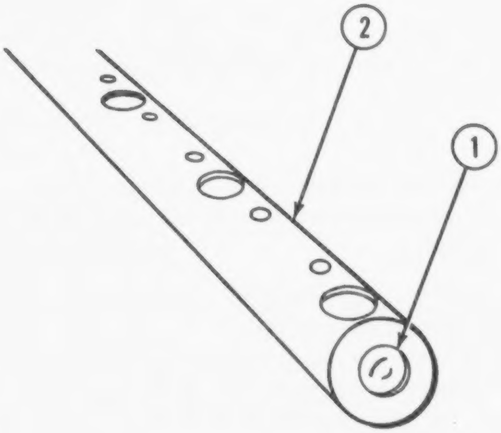
Holes in rocker arm shaft have sharp edges that can hurt you. Be careful when you handle rocker arm shaft.

**NOTE**

Reassemble rocker arm assembly on clean surface.

• • • •

If rocker arm shaft plugs were not removed, go to step 2.



1. INSTALL TWO NEW SHAFT PLUGS IN ROCKER ARM SHAFT.
   - Install two new shaft plugs (1) in shaft (2). Use 1 inch diameter drive pin punch and soft faced hammer.

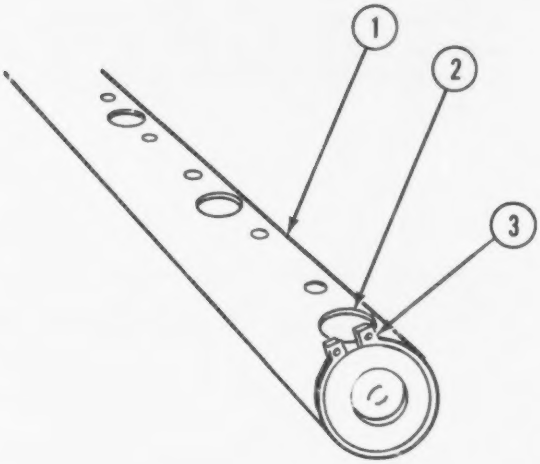
GO TO NEXT PAGE

## D. REASSEMBLY — Continued

### NOTE

Holes at each end of rocker arm shaft have different diameters.

2. INSTALL NEW RETAINING RING ON ROCKER ARM SHAFT END WITH SMALLER HOLE.
   - Determine which end of shaft (1) has smaller hole (2). Use caliper to measure two holes.
   - Install new retaining ring (3) on end of shaft (1) with smaller hole (2). Use retaining ring pliers.



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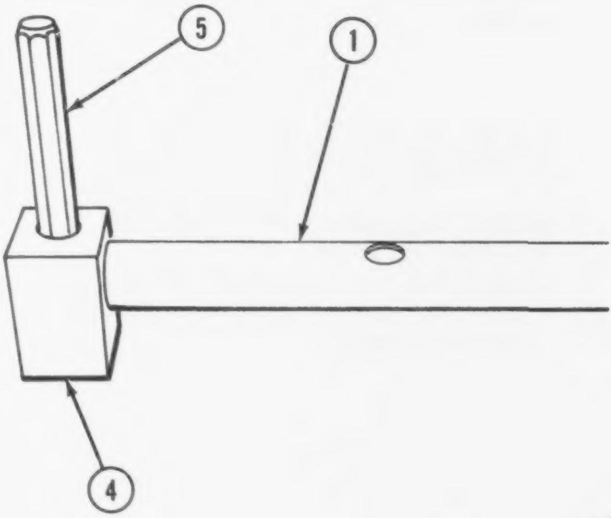
### NOTE

Rocker arm assembly must be reassembled with shaft small oil holes down and retaining ring to your left.

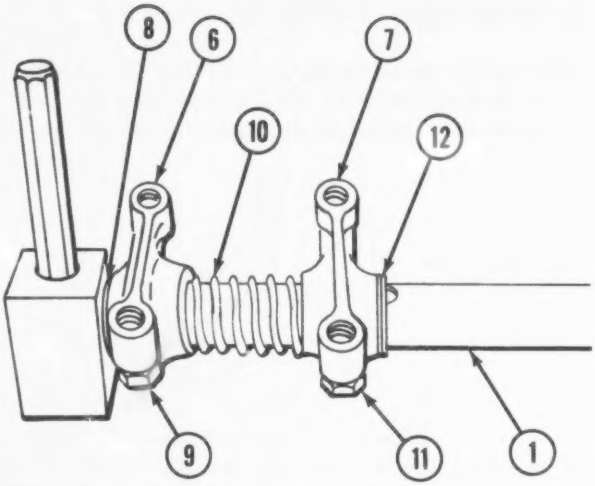
• • • •

Remove tag from each rocker arm and shaft support before each is installed on shaft.

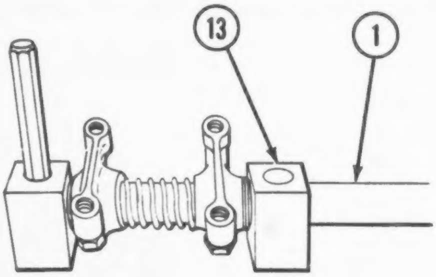
3. INSTALL FIRST SHAFT SUPPORT ON ROCKER ARM SHAFT.
   - Apply light coat of oil to shaft (1).
   - Remove tag from first shaft support (4).
   - Install first shaft support (4) on shaft (1).
   - Put center punch (5) through top of first shaft support (4) and shaft (1).



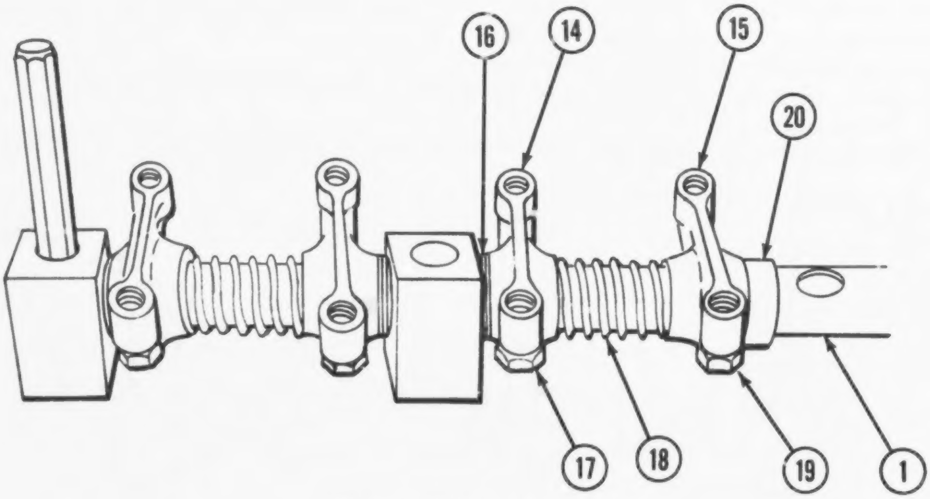
4. INSTALL FIRST AND SECOND ROCKER ARMS ON ROCKER ARM SHAFT.
   - Remove tag from first rocker arm (6) and second rocker arm (7).
   - Install thin spacer (8) and first rocker arm (6), with adjusting screw cup (9) facing down, on shaft (1).
   - Install spring (10), second rocker arm (7), with adjusting screw cup (11) facing down, and two thin spacers (12) on shaft (1).



5. INSTALL SECOND SHAFT SUPPORT ON ROCKER ARM SHAFT.
   - Remove tag from second shaft support (13).
   - Install second shaft support (13) on shaft (1).



6. INSTALL THIRD AND FOURTH ROCKER ARMS ON ROCKER ARM SHAFT.
   - Remove tag from third rocker arm (14) and fourth rocker arm (15).
   - Install two thin spacers (16) and third rocker arm (14), with adjusting screw cup (17) facing down, on shaft (1).
   - Install spring (18), fourth rocker arm (15), with adjusting screw cup (19) facing down, and thick spacer (20) on shaft (1).



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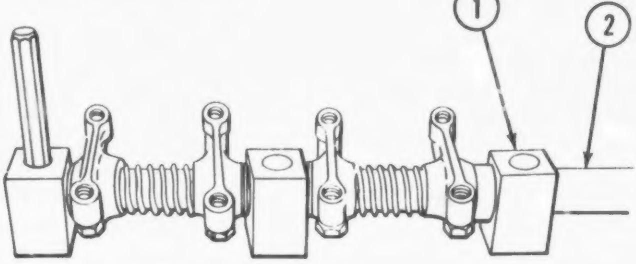
**D. REASSEMBLY — Continued**

7. INSTALL THIRD SHAFT SUPPORT ON ROCKER ARM SHAFT.
   - Remove tag from third shaft support (1).
   - Install third shaft support (1) on shaft (2).



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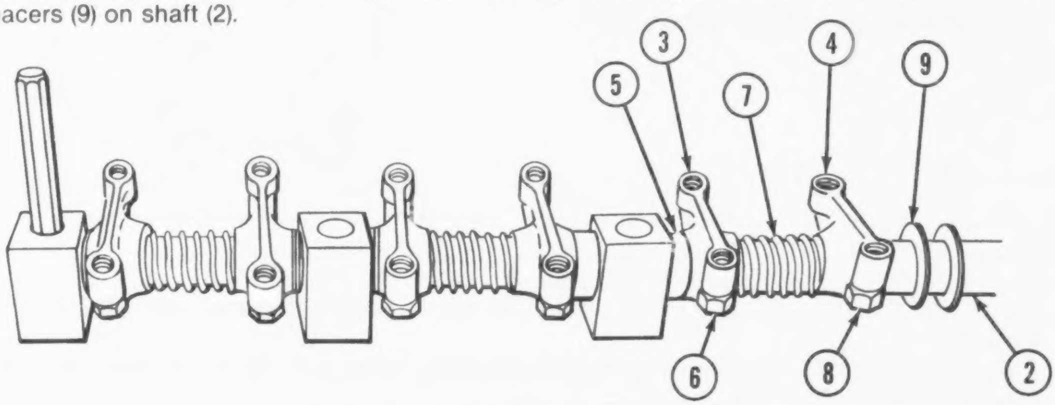
8. INSTALL FIFTH AND SIXTH ROCKER ARMS ON ROCKER ARM SHAFT.
   - Remove tag from fifth rocker arm (3) and sixth rocker arm (4).
   - Install thick spacer (5) and fifth rocker arm (3), with adjusting screw cup (6) facing down, on shaft (2).
   - Install spring (7), sixth rocker arm (4), with adjusting screw cup (8) facing down, and two thin spacers (9) on shaft (2).



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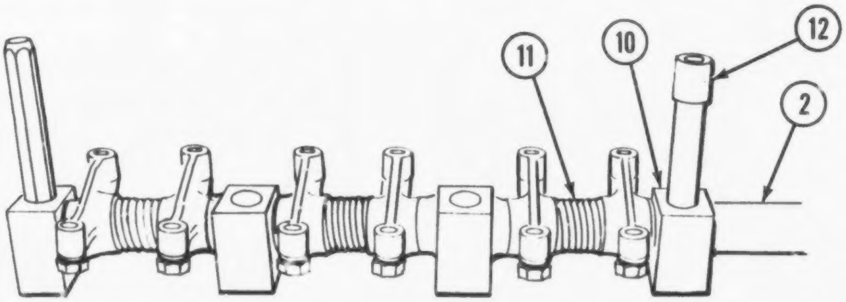
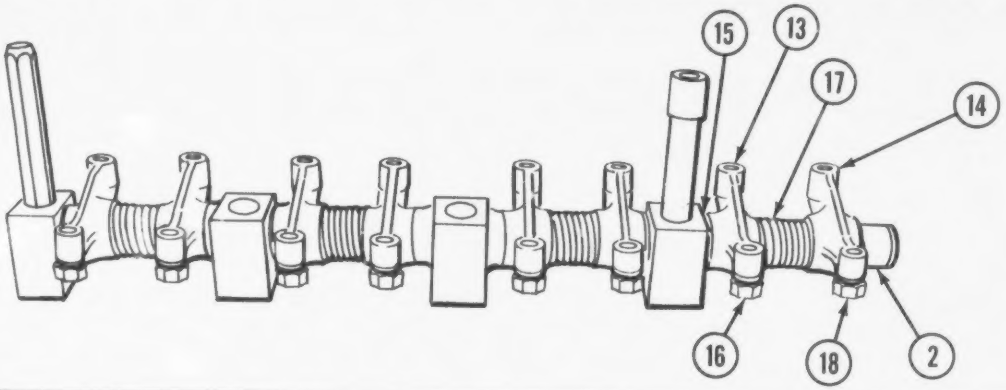
9. INSTALL FOURTH SHAFT SUPPORT ON ROCKER ARM SHAFT.
   - Remove tag from fourth shaft support (10).
   - Install fourth shaft support (10) on shaft (2).
   - Push fourth shaft support (10) to compress spring (11) until holes in fourth shaft support (10) and shaft (2) are alined.
   - Put 3/8 inch drive 5 inch extension (12) through holes in fourth shaft support (10) and shaft (2).



10. INSTALL SEVENTH AND EIGHTH ROCKER ARMS ON ROCKER ARM SHAFT.
    - Remove tag from seventh rocker arm (13) and eighth rocker arm (14).
    - Install two thin spacers (15) and seventh rocker arm (13), with adjusting screw cup (16) facing down, on shaft (2).
    - Install spring (17), and eighth rocker arm (14), with adjusting screw cup (18) facing down, on shaft (2).



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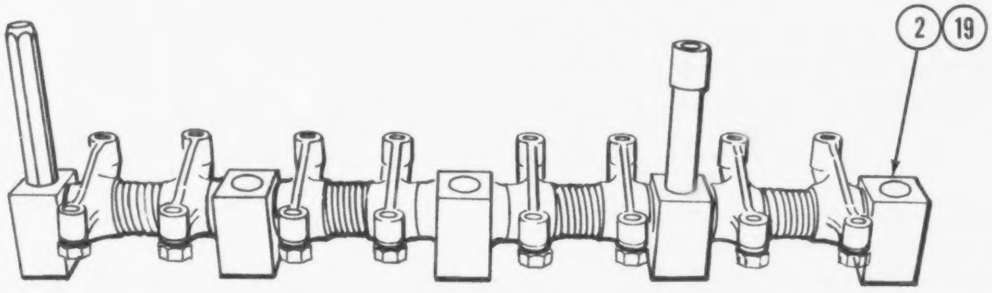
11. INSTALL FIFTH SHAFT SUPPORT ON ROCKER ARM SHAFT.
    - Remove tag from fifth shaft support (19).
    - Install fifth shaft support (19) on shaft (2).



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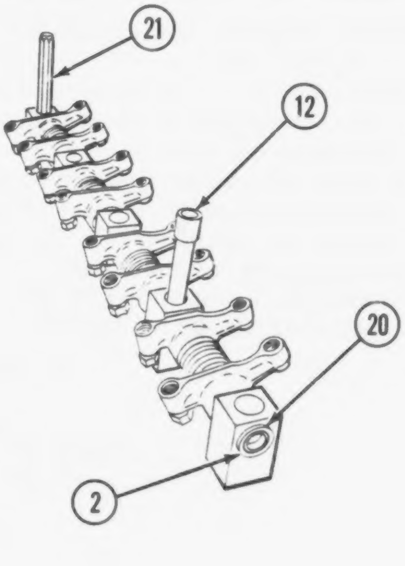
12. INSTALL NEW RETAINING RING ON ROCKER ARM SHAFT.
    - Install new retaining ring (20) on shaft (2). Use retaining ring pliers.
    - Remove center punch (21) and 5 inch extension (12) from rocker arm assembly.



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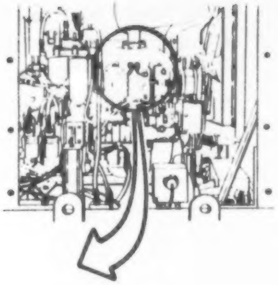
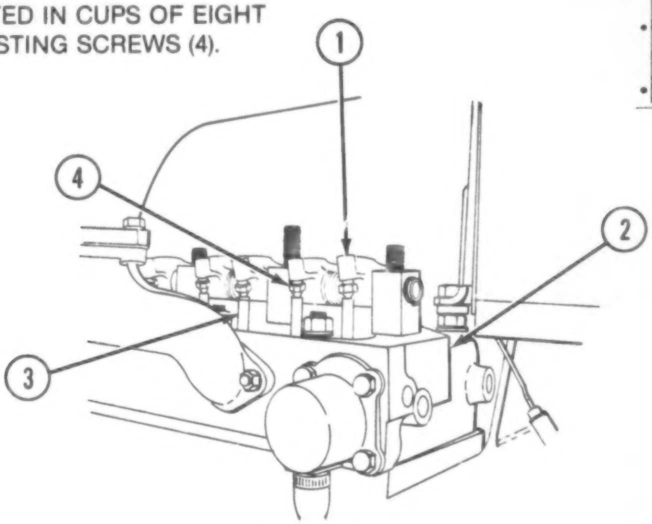
## E. INSTALLATION



1. POSITION ROCKER ARM ASSEMBLY (1) ON CYLINDER HEAD (2) WITH BALL ENDS OF PUSH RODS (3) SEATED IN CUPS OF EIGHT ROCKER ARM ADJUSTING SCREWS (4).



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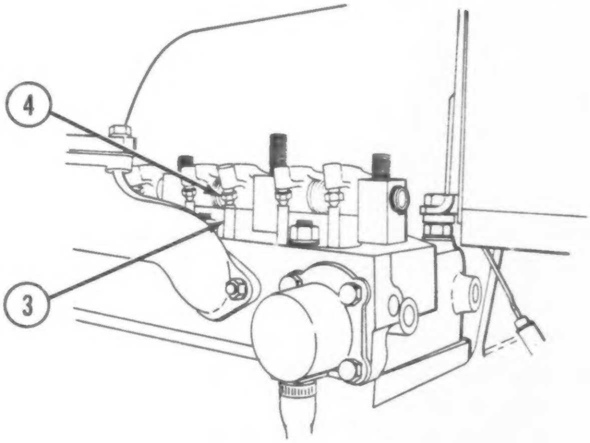
**NOTE**

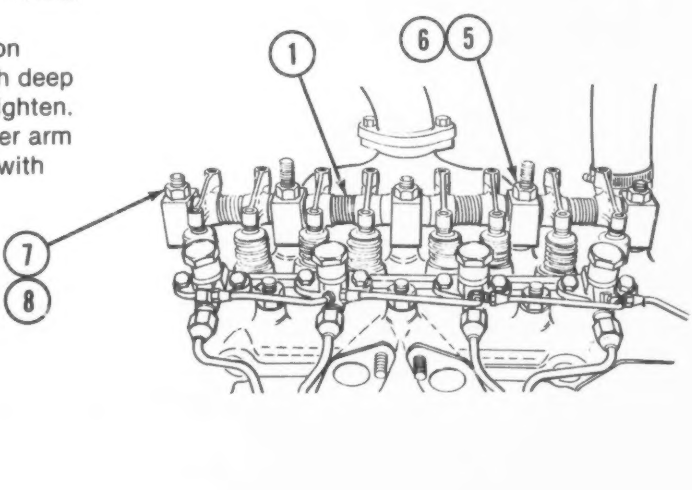
Pushrods must be checked for free rotation prior to tightening nuts on rocker arm assembly.

• • • •

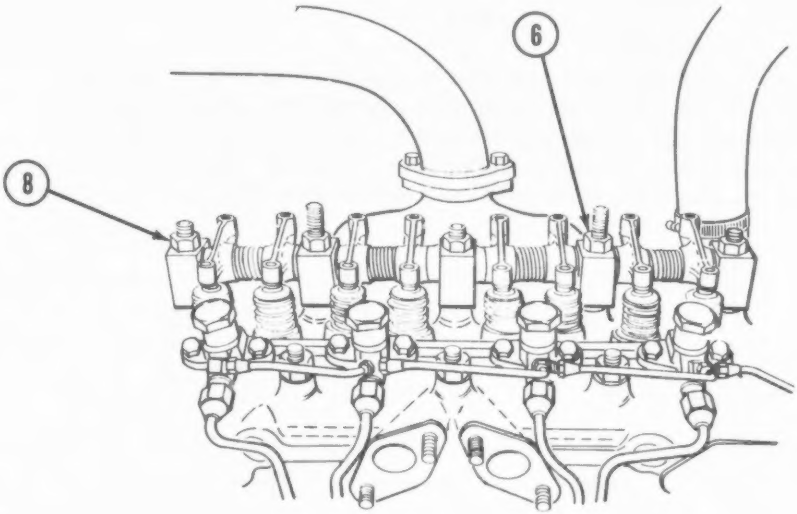
The five nuts on the rocker arm assembly will be torqued several times during this step. Nuts must be torqued in order starting at the front of the engine.



2. INSTALL ROCKER ARM ASSEMBLY ON CYLINDER HEAD.
   - Rotate each pushrod (3) by hand to insure it is free to rotate and seated in cup of rocker arm adjusting screw (4).
   - Install four washers (5) and nuts (6) on rocker arm assembly (1). Use 7/8 inch deep socket with ratchet handle. Do not tighten.
   - Install washer (7) and nut (8) on rocker arm assembly (1). Use 15/16 inch socket with ratchet handle. Do not tighten.



- Tighten four nuts (6) to 75 ft lb (10.4 mkg). Use 7/8 inch deep socket with 1/2 inch drive torque wrench.
- Tighten nut (8) to 75 ft lb (10.4 mkg). Use 15/16 inch socket with 1/2 inch drive torque wrench.
- Tighten four nuts (6) to 125 ft lb (17.3 mkg). Use 7/8 inch deep socket with 1/2 inch drive torque wrench.
- Tighten nut (8) to 125 ft lb (17.3 mkg). Use 15/16 inch socket with 1/2 inch drive torque wrench.
- Tighten four nuts (6) to 147 ft lb (20.3 mkg). Use 7/8 inch deep socket with 1/2 inch drive torque wrench.
- Tighten nut (8) to 147 ft lb (20.3 mkg). Use 15/16 inch socket with 1/2 inch drive torque wrench.
- Tighten nut (8) to 160 ft lb (22.1 mkg). Use 15/16 inch socket with 1/2 inch drive torque wrench.



3. INSTALL EXHAUST MANIFOLD ON ENGINE. (SEE EXHAUST MANIFOLD, PAGE 15-23.)

4. INSTALL ENGINE ASSEMBLY TOP ON SUPPORTS. (SEE TM 9-1095-205-20.)

5. INSTALL MUFFLER ON ENGINE. (SEE TM 9-1095-205-20.)

6. INSTALL ENGINE HINGED PANEL. (SEE TM 9-1095-205-20.)

7. ADJUST VALVES. (SEE ROCKER ARM ASSEMBLY, PAGE 15-210.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Adjust Valve Clearance. (See TM 9-1095-205-20.)
Install Cylinder Head Valve Cover. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

## 15-16 ROCKER ARM ASSEMBLY — Continued

### F. ADJUSTMENT

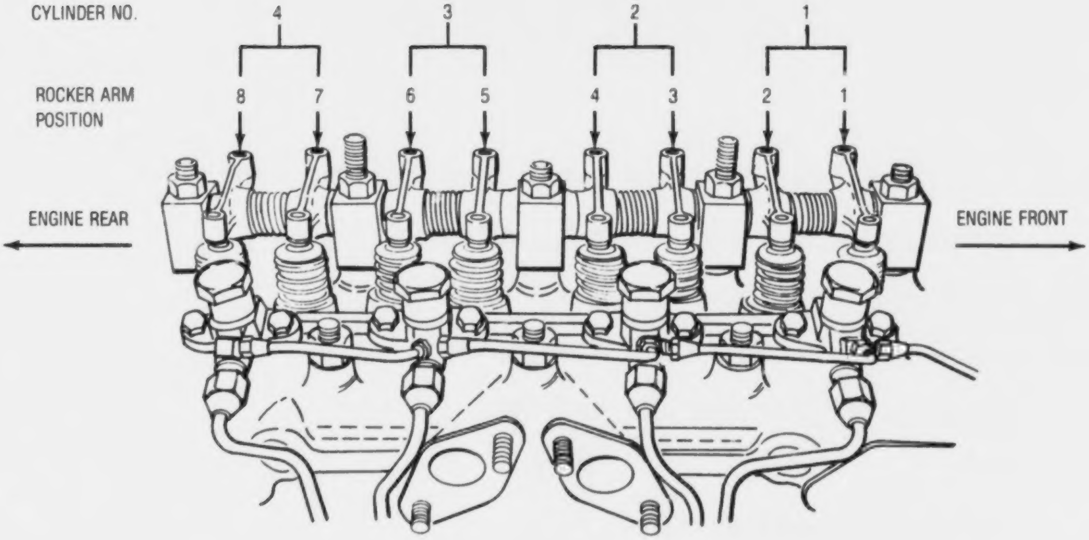
**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Cylinder Head Valve Cover. (See TM 9-1095-205-20.)

**NOTE**

Engine has four cylinders. No. 1 cylinder is at engine front. No. 4 cylinder is at engine rear. There are two rocker arms, pushrods, and valves for each cylinder. There are eight rocker arm positions. (See following Cylinder No. and Rocker Arm Position Locator.) In this locator, radiator inlet hose, air intake pipe, and intake manifold have been removed for clarity.



*Cylinder No. and Rocker Arm Position Locator*

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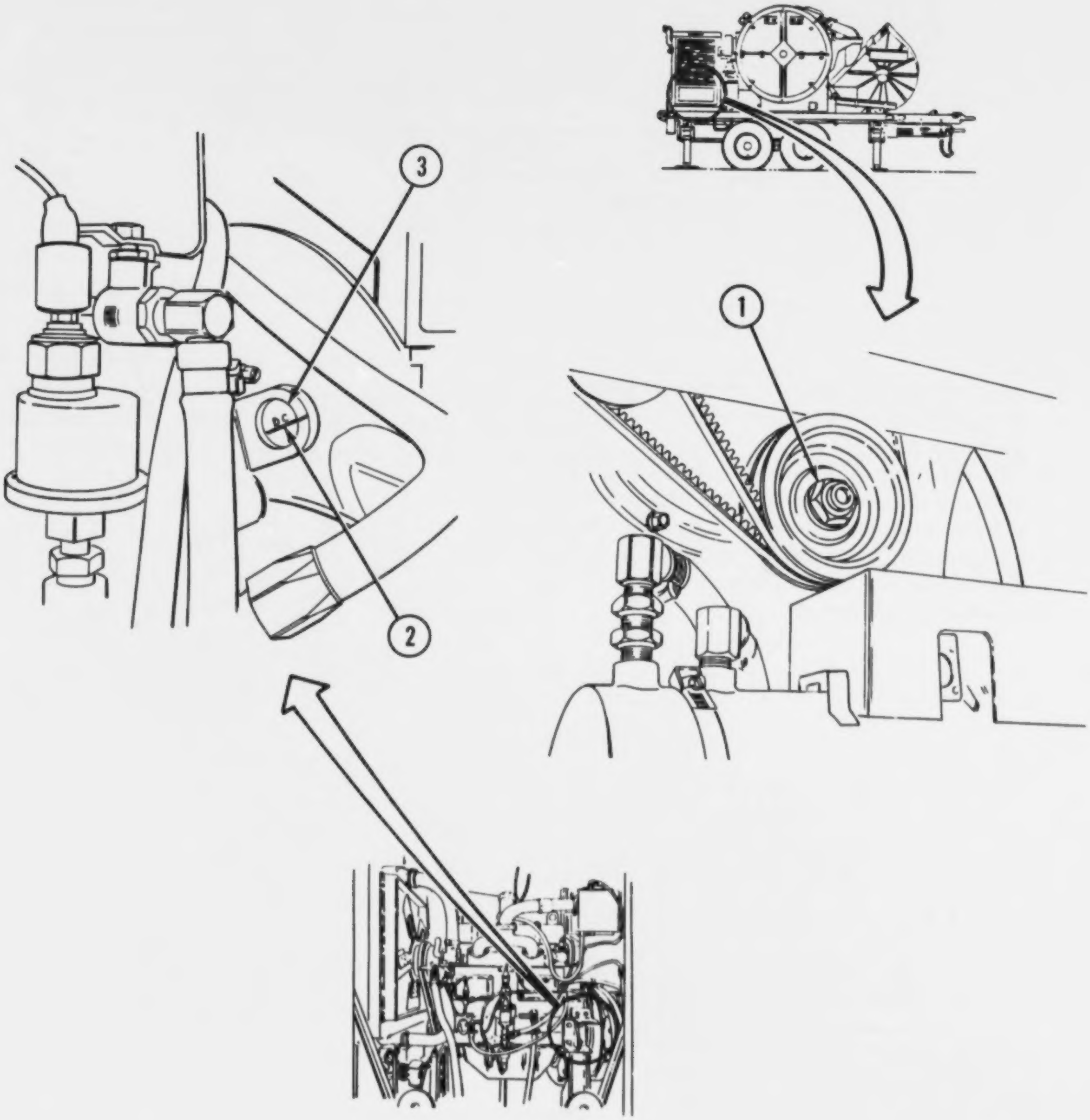
**NOTE**

If No. 1 cylinder pushrods do not turn by hand, No. 4, not No. 1, cylinder is at top dead center.

1. BRING NO. 1 CYLINDER PISTON TO TOP DEAD CENTER.
   - Have helper turn crankshaft nut (1) to right. Have helper use 1 5/8 inch socket with 16 inch extension and 3/4 inch drive hinged handle. Stop helper when DC mark (2) is centered in flywheel housing window (3).



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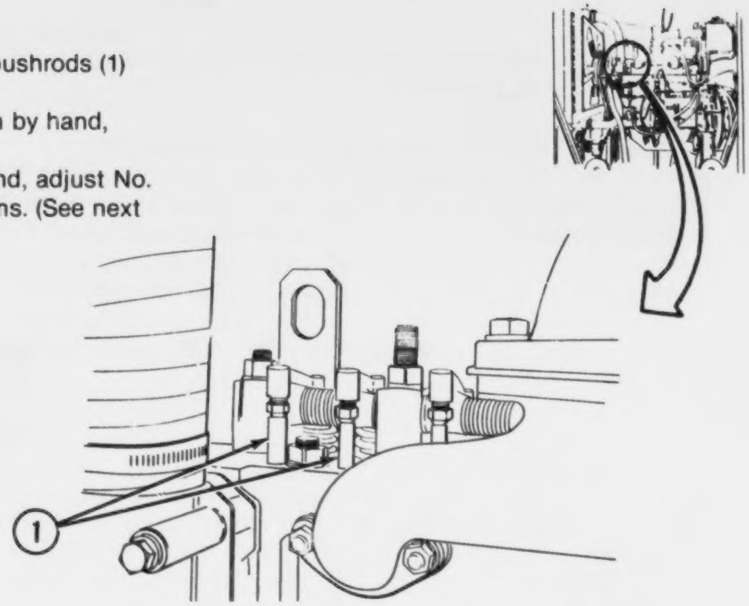
### F. ADJUSTMENT—Continued

- Try to turn two No. 1 cylinder pushrods (1) by hand.
- If both pushrods (1) do not turn by hand, repeat step 1.
- If both pushrods (1) turn by hand, adjust No. 1 and No. 2 position rocker arms. (See next step.)



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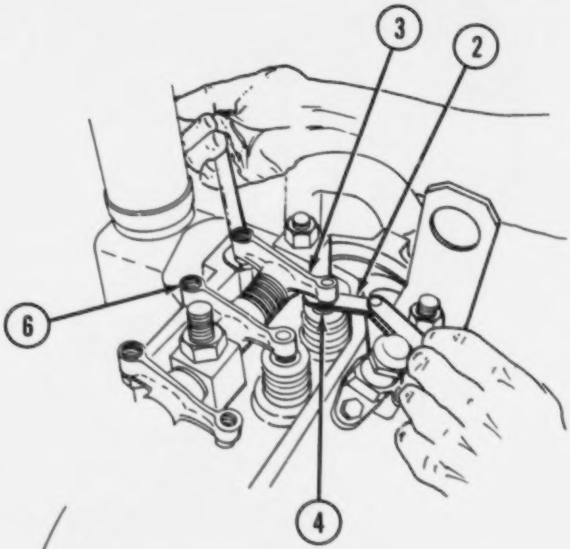
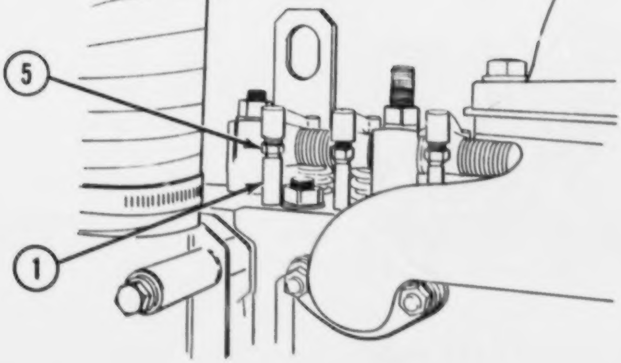
2. ADJUST NO. 1 AND NO. 2 POSITION ROCKER ARMS.
   - Insert 0.016 in. (0.406 mm) thickness gage (2) between No. 1 position rocker arm (3) and valve stem (4).
   - Turn adjusting screw (5) until it just touches push rod (1). Use 1/2 inch open end wrench.
   - Remove thickness gage (2). You should feel a slight drag if adjustment is correct.
   - Repeat above adjusting step for No. 2 position rocker arm (6).

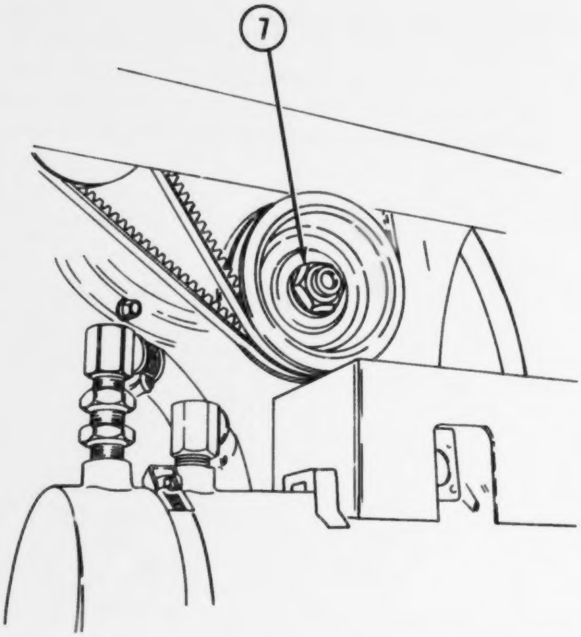




**NOTE**

No. 2 cylinder is at top dead center when you can turn two No. 2 cylinder pushrods by hand. If No. 2 cylinder pushrods do not turn by hand, No. 3, not No. 2, cylinder is at top dead center.

3. BRING NO. 2 CYLINDER PISTON TO TOP DEAD CENTER.
   - Turn crankshaft nut (7) 180° to right. Use 1 5/8 inch socket with 16 inch extension and 3/4 inch drive hinged handle.



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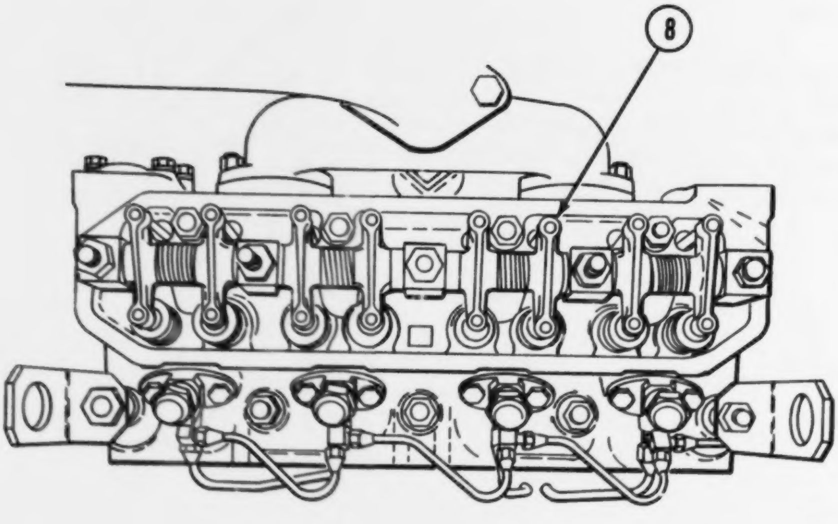
- Try to turn two No. 2 cylinder pushrods (8) by hand.
- If both pushrods (8) do not turn by hand, repeat step 3.
- If both pushrods (8) turn by hand, adjust No. 3 and No. 4 position rocker arms. (See next step.)



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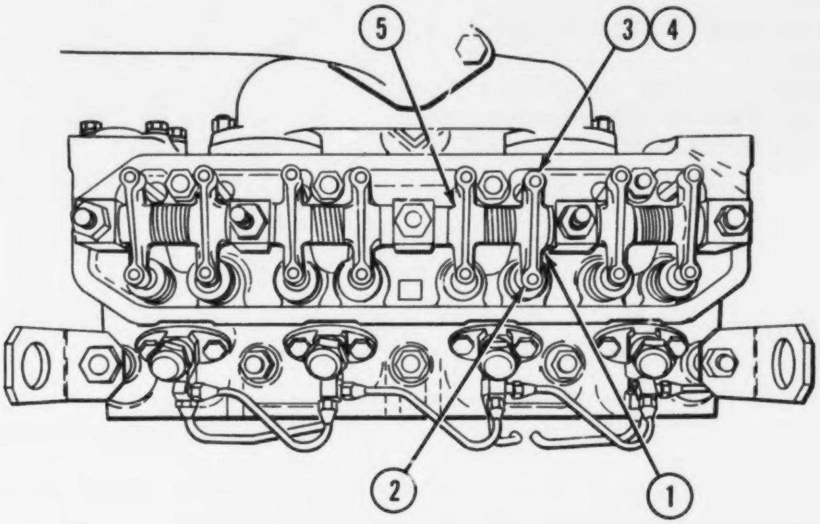
**F. ADJUSTMENT—Continued**

4. ADJUST NO. 3 AND NO. 4 POSITION ROCKER ARMS.
   - Insert 0.016 in. (0.406 mm) thickness gage between No. 3 position rocker arm (1) and valve stem (2).
   - Turn adjusting screw (3) until it just touches push rod (4). Use 1/2 inch open end wrench.
   - Remove thickness gage. You should feel a slight drag if adjustment is correct.
   - Repeat above adjusting steps for No. 4 position rocker arm (5).



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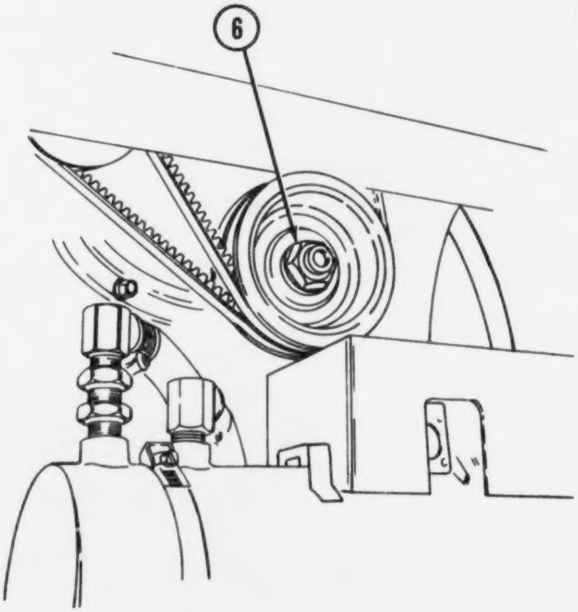
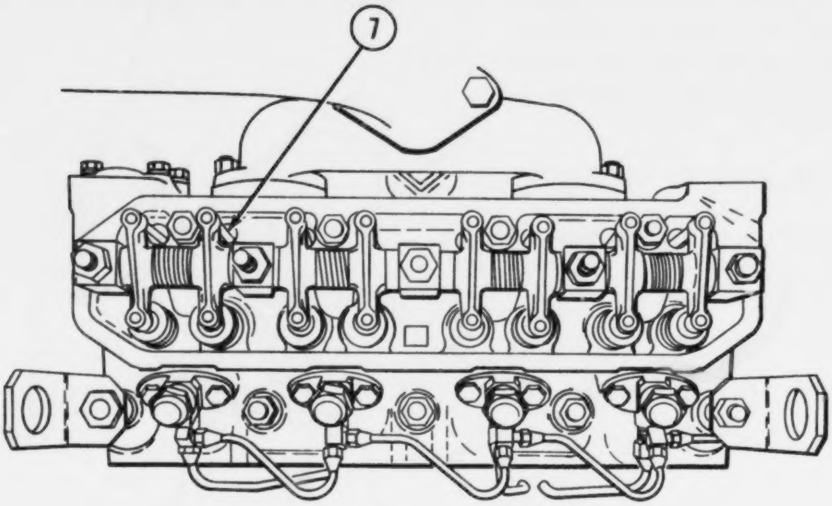
**NOTE**

No. 4 cylinder is at top dead center when you can turn two No. 4 cylinder pushrods by hand. If No. 4 cylinder pushrods do not turn by hand, No. 1, not No. 4, cylinder is at top dead center.

5. BRING NO. 4 CYLINDER PISTON TO TOP DEAD CENTER.
   - Turn crankshaft nut (6) 180° to right. Use 1 5/8 inch socket with 16 inch extension and 3/4 inch drive hinged handle.



- Try to turn two No. 4 cylinder pushrods (7) by hand.
- If both pushrods (7) do not turn by hand, repeat step 5.
- If both pushrods (7) turn by hand, adjust No. 7 and No. 8 position rocker arms. (See next step.)



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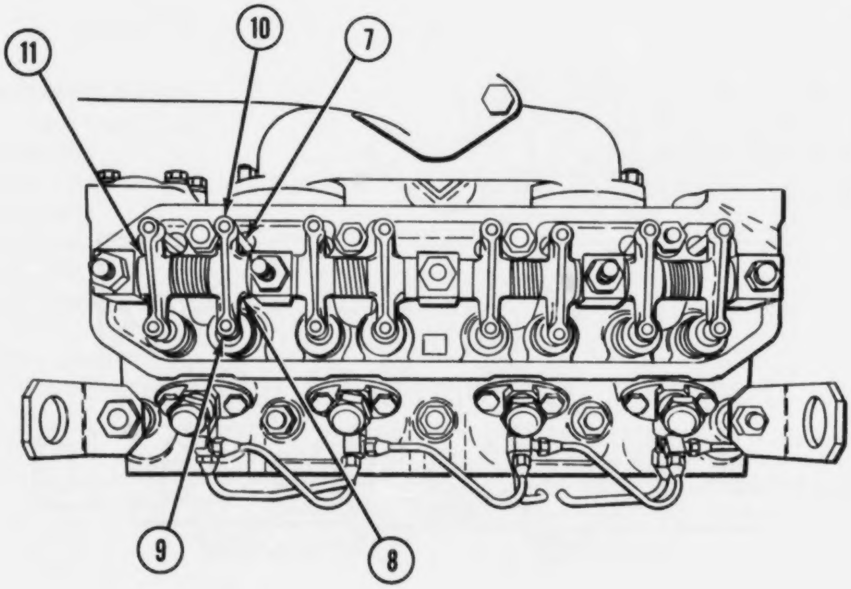
6. ADJUST NO. 7 AND NO. 8 POSITION ROCKER ARMS.
   - Insert 0.016 in. (0.406 mm) thickness gage between No. 7 position rocker arm (8) and valve stem (9).
   - Turn adjusting screw (10) until it just touches push rod (7). Use 1/2 inch open end wrench.
   - Remove thickness gage. You should feel a slight drag if adjustment is correct.
   - Repeat above adjusting steps for No. 8 position rocker arm (11).



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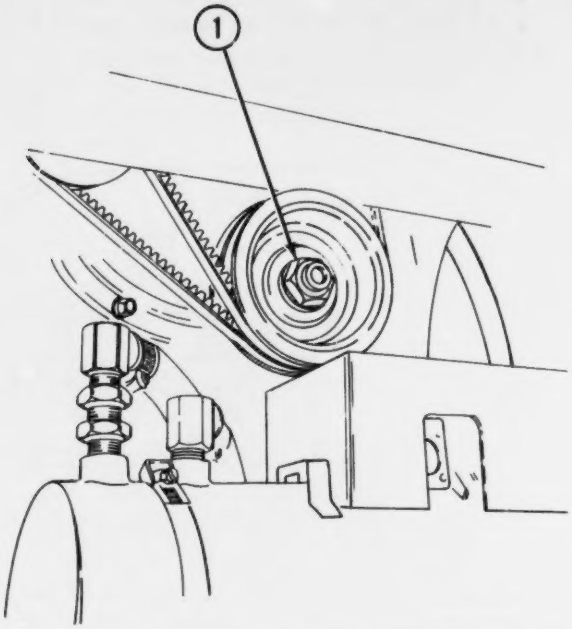
**F. ADJUSTMENT—Continued**

**NOTE**

No. 3 cylinder is at top dead center when you can turn two No. 3 cylinder pushrods by hand. If No. 3 cylinder pushrods do not turn by hand, No. 2, not No. 3, cylinder is at top dead center.

7. BRING NO. 3 CYLINDER TO TOP DEAD CENTER.
   - Turn crankshaft nut (1) 180° to right. Use 1 5/8 inch socket with 16 inch extension and 3/4 inch drive hinged handle.



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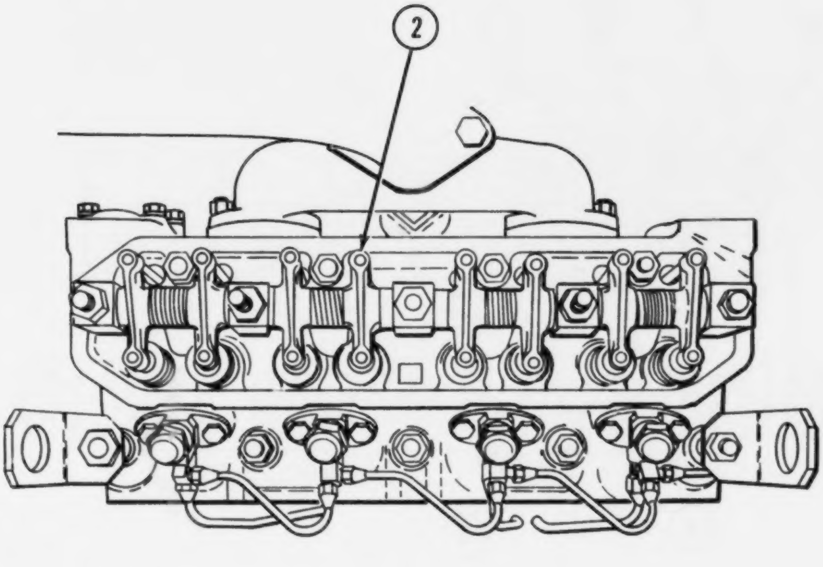
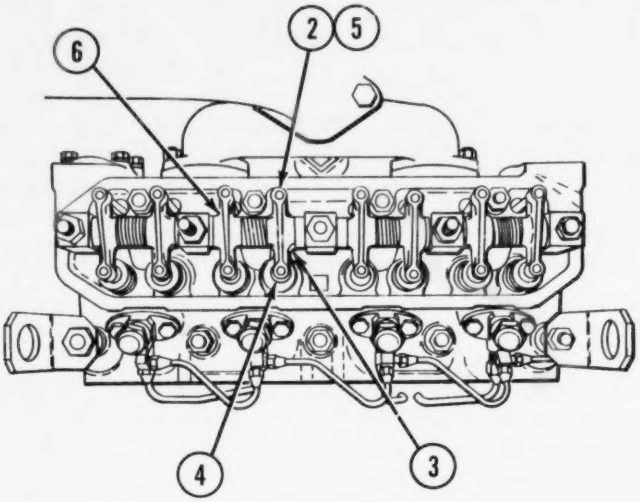
- Try to turn two No. 3 cylinder pushrods (2) by hand.
- If both pushrods (2) do not turn by hand, repeat step 7.
- If both pushrods (2) turn by hand, adjust No. 5 and No. 6 position rocker arms. (See next step.)



8. ADJUST NO. 5 AND NO. 6 POSITION ROCKER ARMS.
   - Insert 0.016 in. (0.406 mm) thickness gage between No. 5 position rocker arm (3) and valve stem (4).
   - Turn adjusting screw (5) until it just touches push rod (2). Use 1/2 inch open end wrench.
   - Remove thickness gage. You should feel a slight drag if adjustment is correct.
   - Repeat above adjusting steps for No. 6 position rocker arm (6).



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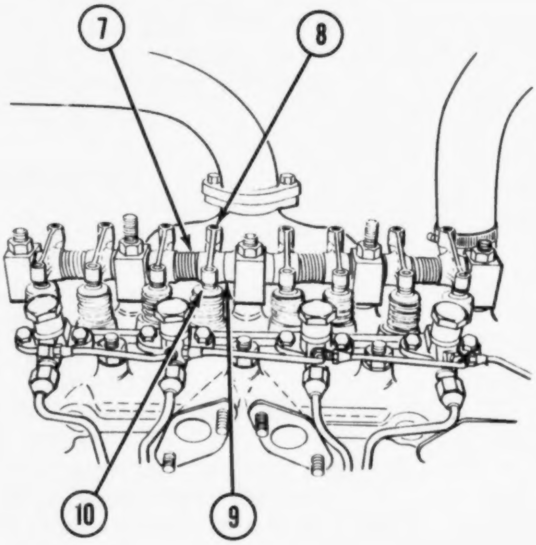
9. LUBRICATE ROCKER ARM ASSEMBLY.
   - Pour oil on rocker arm assembly (7). (See LO 9-1095-205-12.) Use hand oiler. Be sure to oil between eight rocker arms (8) and 11 spacers (9) and between eight rocker arms (8) and eight valve stems (10).



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Adjust Valve Clearance. (See TM 9-1095-205-20.)
Install Cylinder Head Valve Cover. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

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END OF TASK

## 15-17 CYLINDER HEAD ASSEMBLY

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-220)
B. INSTALLATION (p 15-224)
C. CYLINDER HEAD DISASSEMBLY (p 15-231)
D. CLEANING (p 15-233)
E. INSPECTION (p 15-235)
F. VALVE GUIDE REPLACEMENT (p 15-238)
G. VALVE SEAT REFINISHING (p 15-239)
H. VALVE GRINDING (p 15-240)
I. VALVE SEATING (p 15-240)
J. CYLINDER HEAD REASSEMBLY (p 15-242)

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### INITIAL SETUP

*Tools and Special Tools:*

- General mechanic's tool kit 5180-00-177-7033:
  - 9/16 inch box end wrench
  - 1 inch open end wrench
  - 1/2 inch socket
  - 15/16 inch socket
  - 5 inch extension
  - Ratchet handle
  - Hinged handle
  - Putty knife
  - Round nose pliers
  - Thickness gage
- Soft faced hammer 5120-00-903-8553
- Orbital sander
- Depth gage 5120-00-619-4045
- Torque wrench 5120-00-640-6364
- Seat grinder 4910-00-060-9983
- Lapper 5120-00-289-0502
- Valve grinder 4910-00-540-4679
- Reamer set 5110-00-595-9283
- Spring tester 6635-00-641-7436
- Vernier caliper 5120-00-293-2913
- Machinist's rule 5210-00-234-5224
- Bore brush
- Carbon scraper 5110-00-251-6481
- Wire brush 5130-00-263-0235
- Drill motor 5130-00-889-8993
- Goggles 4240-00-269-7912
- Blow gun 4140-00-333-5541
- Air compressor 5310-00-542-4566
- Degreaser 4940-00-449-6689
- 3/4 inch drive 1 5/16 inch socket 5120-00-243-7343
- 3/4 inch drive sliding tee handle 5120-00-709-4072

*Tools and Special Tools — Continued:*

- Valve spring lifter 5120-00-239-8686
- 7/8 inch deep socket 5120-00-243-7342
- Wire wheel arbor adapter 3445-00-356-8747
- Utility grinding machine 3415-00-517-7754
- Rotary wheel wire brush 5310-00-473-6444
- Micrometer 5120-00-540-2973
- Arbor press 3444-00-243-2634
- Hand oiler 4930-00-274-5713
- Spring tester 6635-00-641-7436
- 1/2 inch x 6 inch steel rod, Appendix C

*Materials/Parts:*

- Cylinder head gasket 5330-00-630-3563
- Lubricating oil (see LO 9-1095-205-12), Item 16, Appendix B
- Solvent, Item 28, Appendix B
- Rag, Item 22, Appendix B
- Type 2 lapping compound, Item 14, Appendix B
- Type 1 lapping compound, Item 15, Appendix B
- Crocus cloth, Item 4, Appendix B
- Gasket 5330-00-971-5607
- Lock washer (4) 5310-00-209-0920
- Lock washer
- Valve guide (8) 2815-00-961-1674
- Sealing compound, Item 25, Appendix B
- Plastic sheet, Item 20, Appendix B
- Masking tape, Item 19, Appendix B

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

*References:*
LO 9-1095-205-12
TM 9-1095-205-10
TM 9-1095-205-20
EXHAUST MANIFOLD, Page 15-23
FUEL NOZZLE ASSEMBLIES, Page 15-187
ROCKER ARM ASSEMBLY, Page 15-199

*Personnel Required:*
Mechanic
Helper

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## OVERVIEW

Seal fluid line fittings. Nonflared fittings or fittings without seal, gasket, preformed packing, or other sealing hardware, need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

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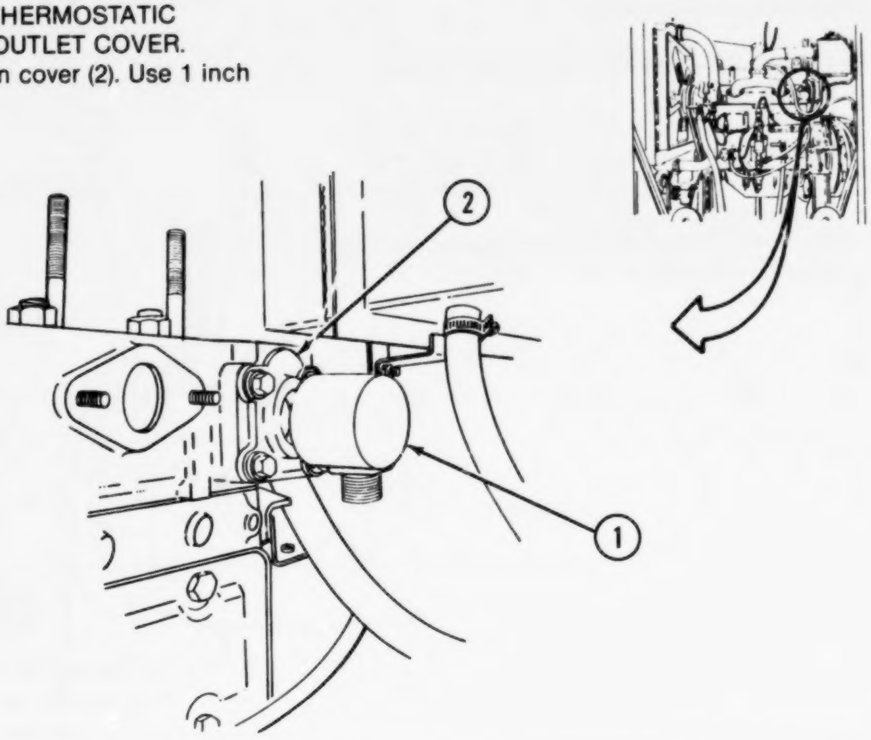
## A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Remove Hinged Panel. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Lifting Eyes. (See TM 9-1095-205-20.)
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Fuel Nozzle Assemblies. (See Fuel Nozzle Assemblies, Page 15-187.)
Remove Bypass Hose. (See TM 9-1095-205-20.)
Remove Thermostat Housing. (See TM 9-1095-205-20.)
Remove Muffler And Protective Cap Assembly. (See TM 9-1095-205-20.)
Remove Exhaust Manifold. (See Exhaust Manifold, Page 15-23.)
Remove Air Cleaner Filter Element. (See TM 9-1095-205-20.)
Remove Air Filter Housing. (See TM 9-1095-205-20.)
Remove Air Intake Pipe. (See TM 9-1095-205-20.)
Remove Valve Cover. (See TM 9-1095-205-20.)
Remove Rocker Arm Assembly. (See Rocker Arm Assembly, Page 15-199.)
Remove Cold Start Thermostat Cable Assembly. (See TM 9-1095-205-20.)

1. REMOVE COLD START THERMOSTATIC SWITCH FROM WATER OUTLET COVER.
   - Remove switch (1) from cover (2). Use 1 inch open end wrench.



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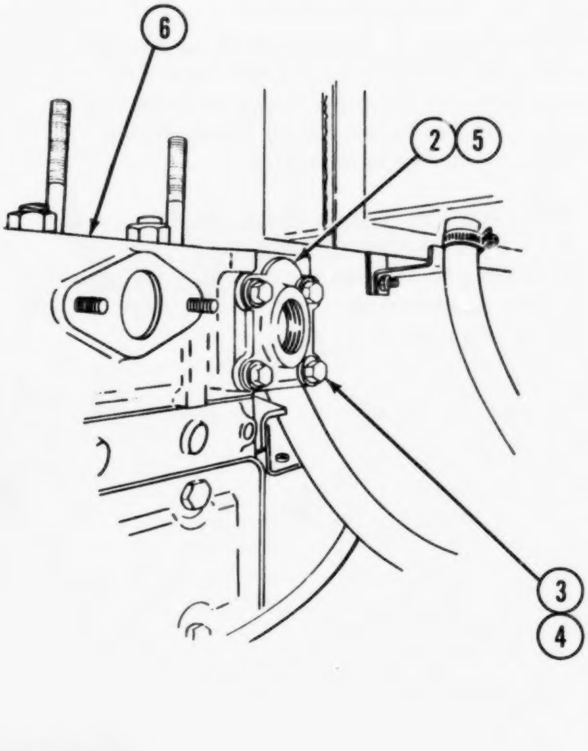
**WARNING**

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

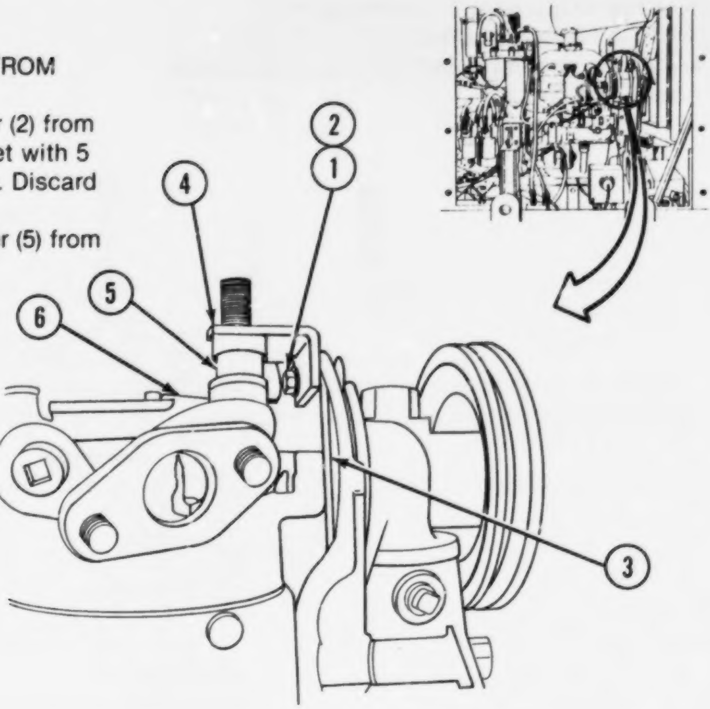
2. REMOVE WATER OUTLET COVER FROM CYLINDER HEAD ASSEMBLY.
   - Remove four screws (3), lock washers (4), cover (2), and gasket (5) from cylinder head assembly (6). Use 9/16 inch box end wrench. Discard lock washers.
   - Clean gasket mating surfaces of cover (2) and cylinder head assembly (6). Use putty knife, solvent and rags.



GO TO NEXT PAGE

**A. REMOVAL — Continued**

3. REMOVE WATER PUMP BRACKET FROM ENGINE BLOCK.
   - Remove screw (1) and lock washer (2) from water pump (3). Use 1/2 inch socket with 5 inch extension and ratchet handle. Discard lock washer.
   - Remove bracket (4) and flat washer (5) from engine block (6).



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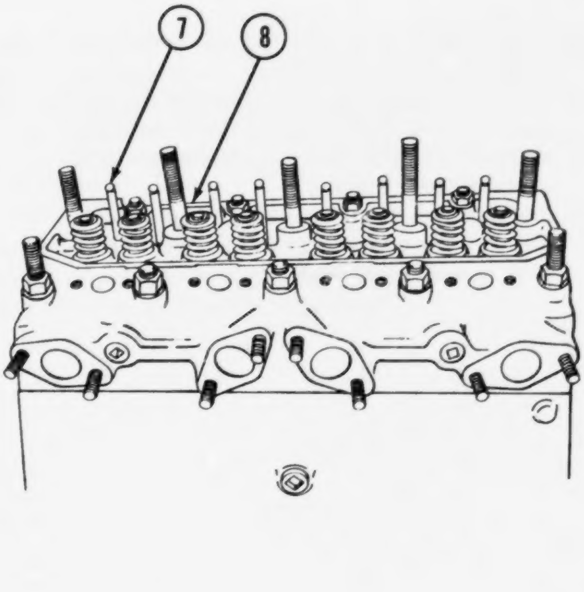
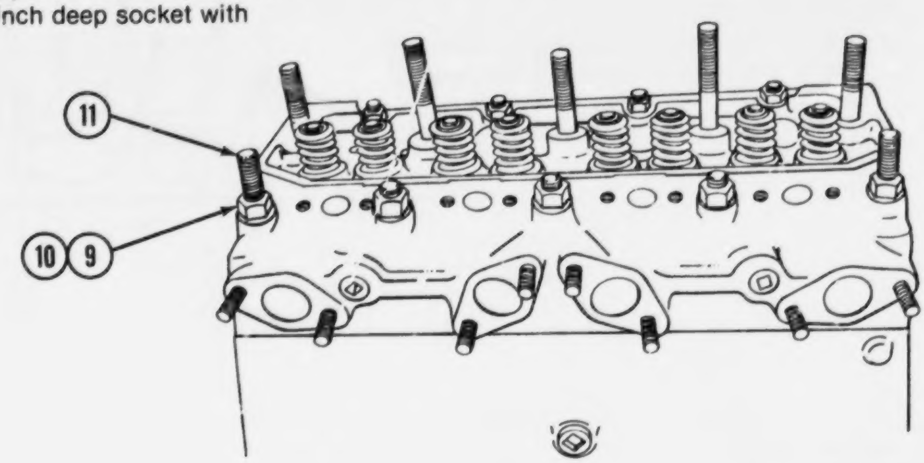
**CAUTION**

Engine can be damaged unless each push rod is installed in position from which it was removed. Keep push rods in order. Tag and mark each push rod as it is removed from cylinder head assembly.

4. REMOVE EIGHT PUSH RODS FROM CYLINDER HEAD ASSEMBLY.
   - Remove eight push rods (7) from cylinder head assembly (8).
   - Tag and mark push rods.



5. REMOVE NINE CYLINDER HEAD MOUNTING NUTS AND WASHERS FROM STUDS.
   - Remove nine nuts (9) and washers (10) from studs (11). Use 7/8 inch deep socket with hinged handle.



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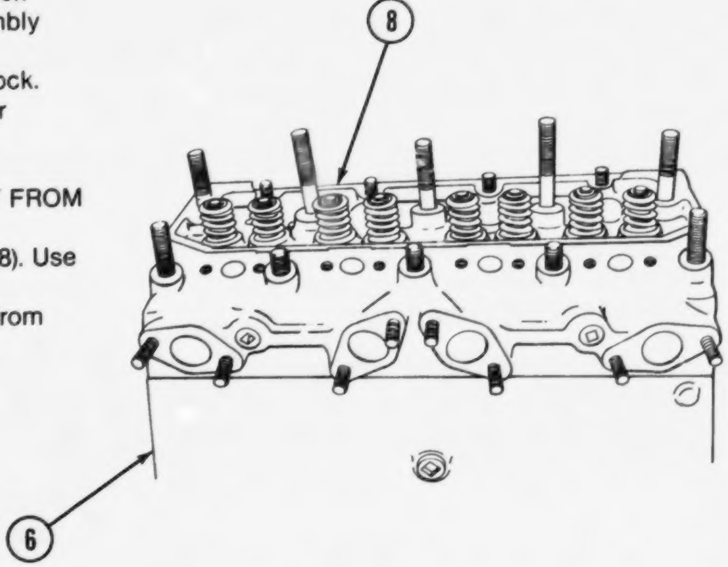
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

Cylinder head assembly and engine block can be damaged if cylinder head assembly is pried from engine block. Do not pry cylinder head assembly from engine block. Do not insert anything between cylinder head assembly and engine block.

6. REMOVE CYLINDER HEAD ASSEMBLY FROM ENGINE BLOCK.
   - Tap around cylinder head assembly (8). Use soft faced hammer.
   - Remove cylinder head assembly (8) from engine block (6). Use helper.



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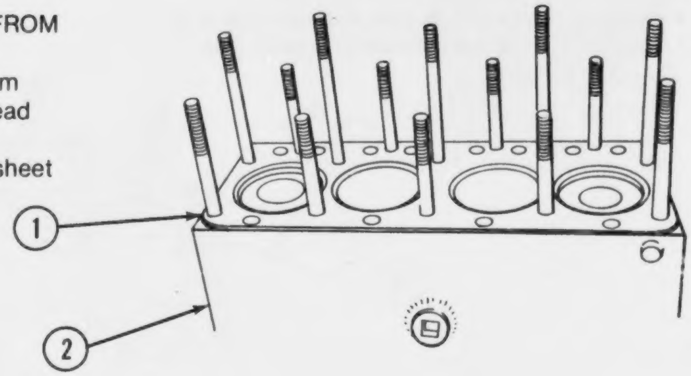
## A. REMOVAL — Continued

7. REMOVE CYLINDER HEAD GASKET FROM ENGINE BLOCK.
   - Remove cylinder head gasket (1) from engine block (2). Discard cylinder head gasket.
   - Cover engine block (2). Use plastic sheet and masking tape.



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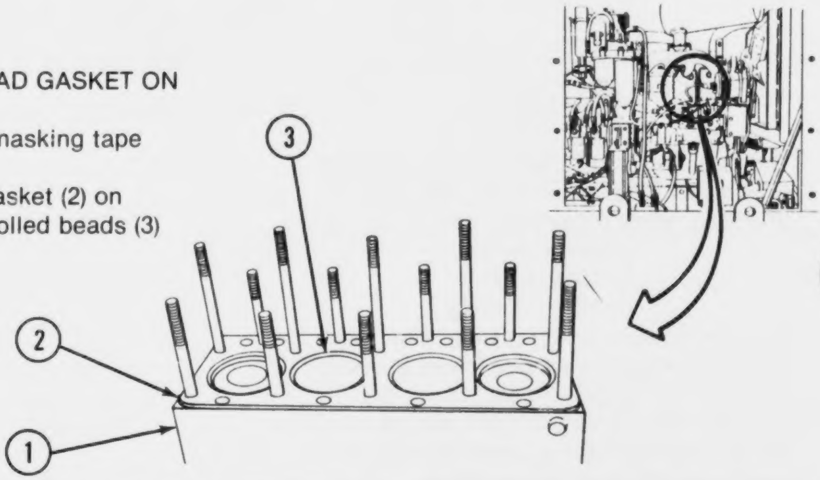
## B. INSTALLATION

1. INSTALL NEW CYLINDER HEAD GASKET ON ENGINE BLOCK.
   - Remove plastic sheet and masking tape from engine block (1).
   - Install new cylinder head gasket (2) on engine block (1), with four rolled beads (3) facing down.



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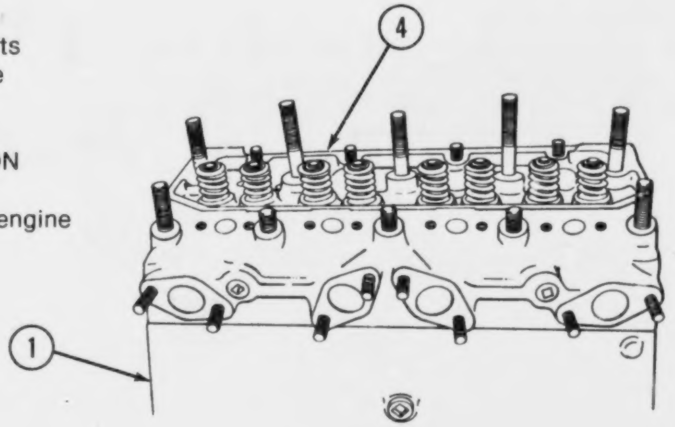
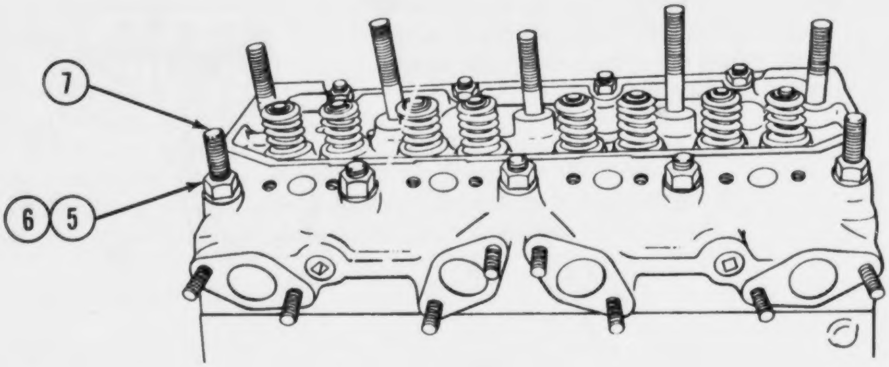
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

2. MOUNT CYLINDER HEAD ASSEMBLY ON ENGINE BLOCK.
   - Mount cylinder head assembly (4) on engine block (1). Use helper.



3. INSTALL NINE WASHERS (5) AND CYLINDER HEAD MOUNTING NUTS (6) ON STUDS (7).



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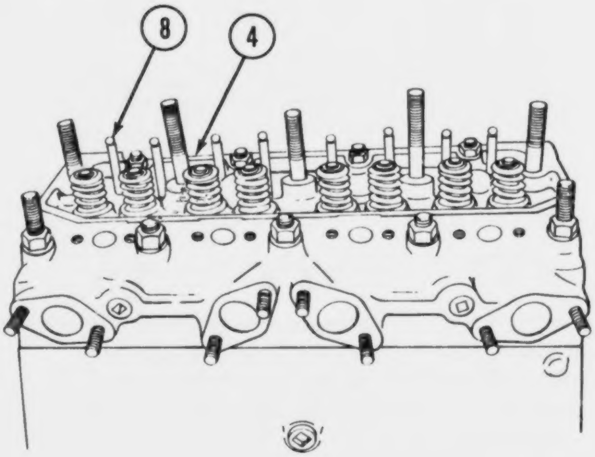
**NOTE**

Remove tag from each push rod before installation.

4. INSTALL EIGHT PUSH RODS IN CYLINDER HEAD ASSEMBLY.
   - Remove tag from push rod (8).
   - Install push rod (8) in cylinder head assembly (4).
   - Repeat above installation steps for other seven push rods.



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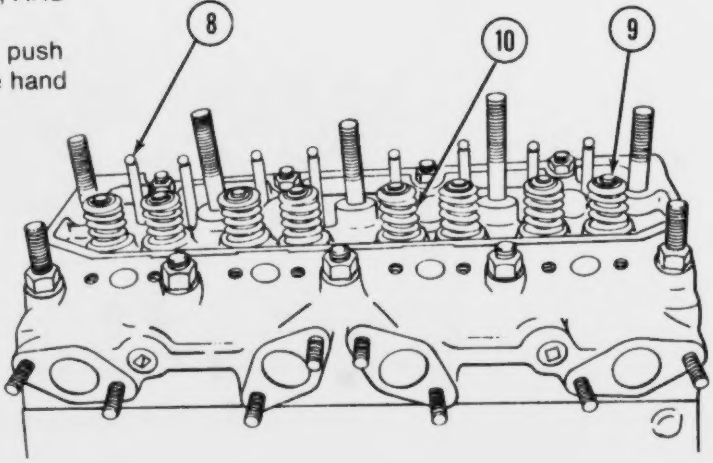
5. LUBRICATE EIGHT VALVES, SPRINGS, AND PUSH RODS.
   - Oil eight valves (9), springs (10), and push rods (8). (See LO 9-1095-205-12.) Use hand oiler.
   - Wipe up excess oil. Use rags.



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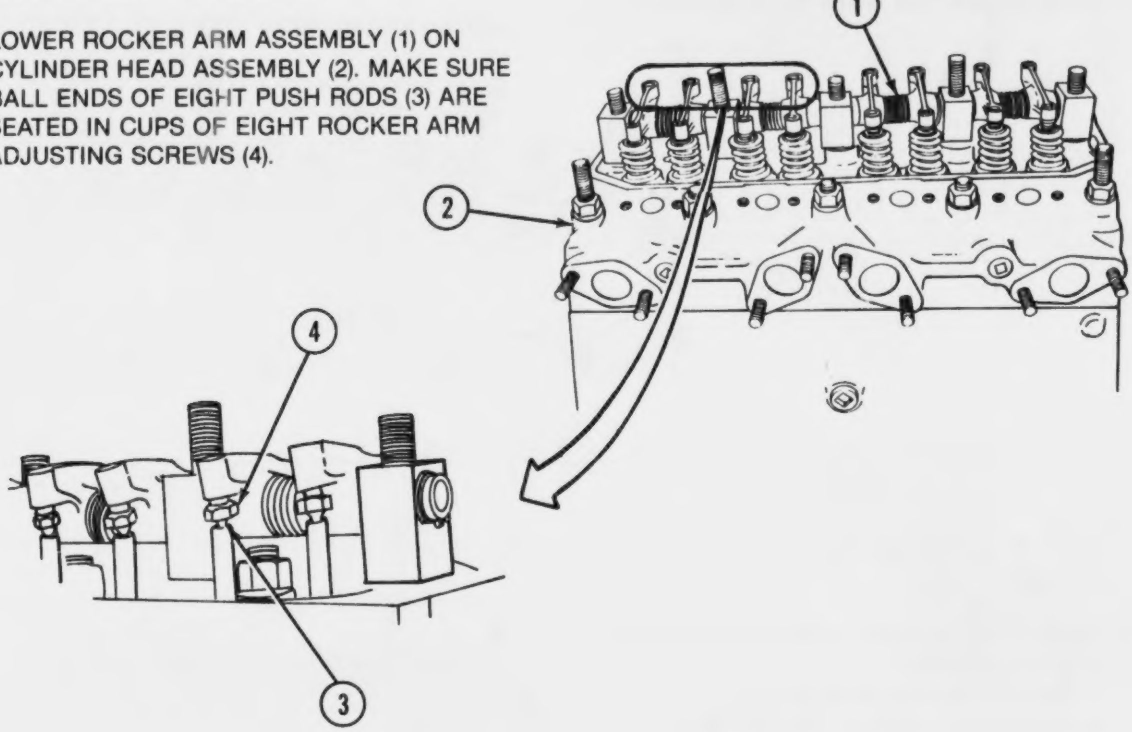
**B. INSTALLATION — Continued**

6. LOWER ROCKER ARM ASSEMBLY (1) ON CYLINDER HEAD ASSEMBLY (2). MAKE SURE BALL ENDS OF EIGHT PUSH RODS (3) ARE SEATED IN CUPS OF EIGHT ROCKER ARM ADJUSTING SCREWS (4).



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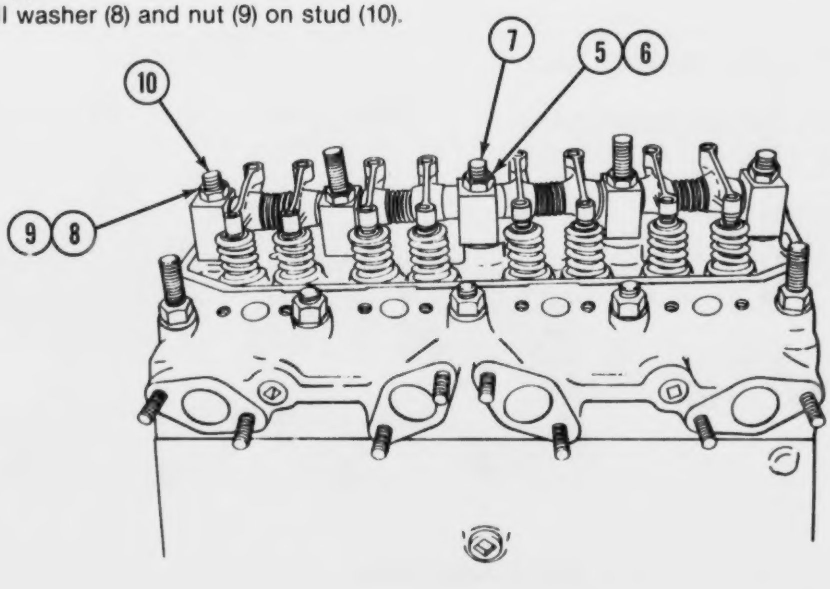
7. INSTALL FIVE WASHERS AND CYLINDER HEAD MOUNTING NUTS ON FIVE STUDS.
   - Install four washers (5) and nuts (6) on four studs (7).
   - Install washer (8) and nut (9) on stud (10).



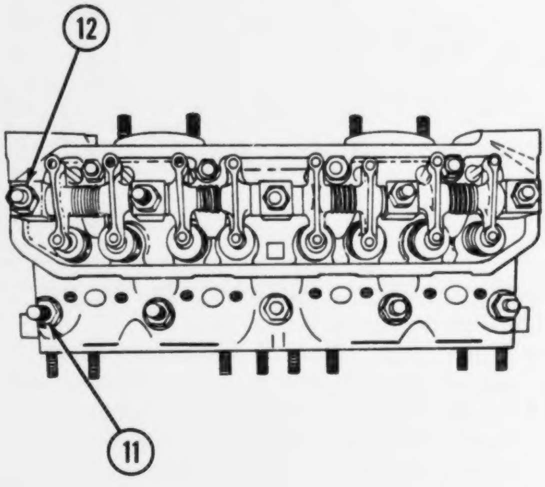
**CAUTION**

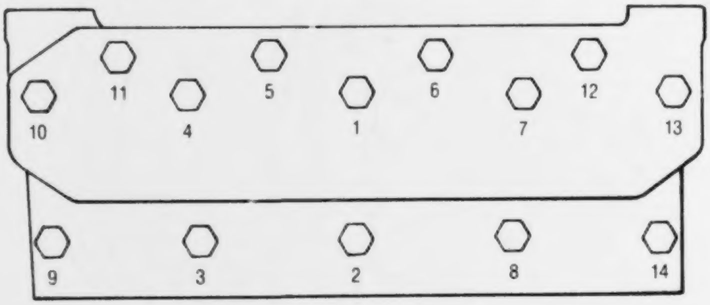
Engine may be damaged if cylinder head mounting nuts are not torqued correctly. Torque mounting nuts in order shown in following Cylinder Head Mounting Nut Torquing Sequence.

**NOTE**

Mounting nut at torquing sequence Position 10 requires a 15/16 inch socket. Other mounting nuts require a 7/8 inch deep socket. Mounting nut at torquing sequence Position 10 requires more torque than other nuts.

8. TORQUE 14 CYLINDER HEAD MOUNTING NUTS.
   - Torque 13 nuts (11) and nut (12) to 75 ft lb (10.4 mkg). (See following Cylinder Head Mounting Nut Torquing Sequence.) Use 15/16 inch socket, 7/8 inch deep socket, and torque wrench.
   - Torque 13 nuts (11) and nut (12) to 125 ft lb (17.3 mkg). (See following Cylinder Head Mounting Nut Torquing Sequence.) Use 15/16 inch socket, 7/8 inch deep socket, and torque wrench.
   - Torque 13 nuts (11) and nut (12) to 147 ft lb (20.3 mkg). (See following Cylinder Head Mounting Nut Torquing Sequence.) Use 15/16 inch socket, 7/8 inch deep socket, and torque wrench.
   - Torque nut (12) to 160 ft lb (22.1 mkg). Use 15/16 inch socket and torque wrench.



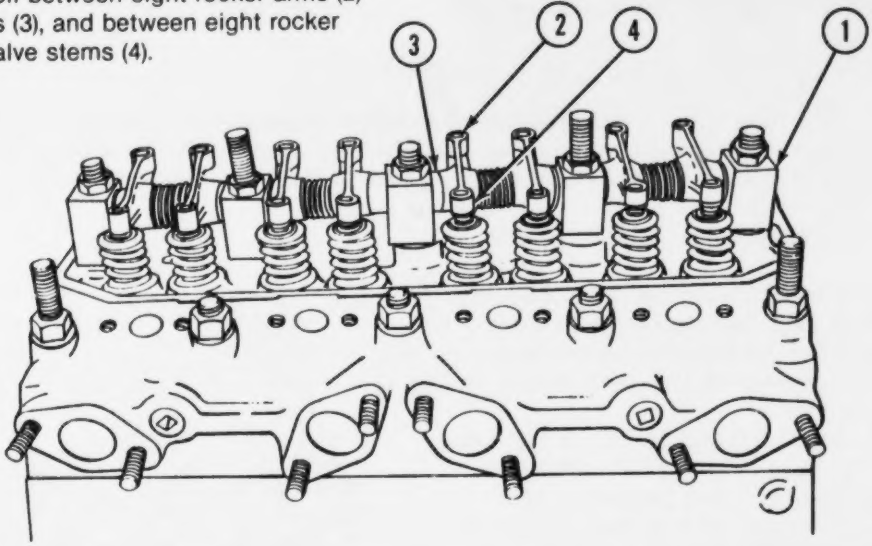


*Cylinder Head Mounting Nut Torquing Sequence*

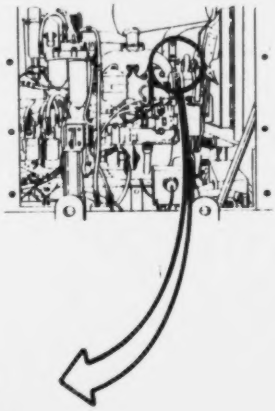
GO TO NEXT PAGE

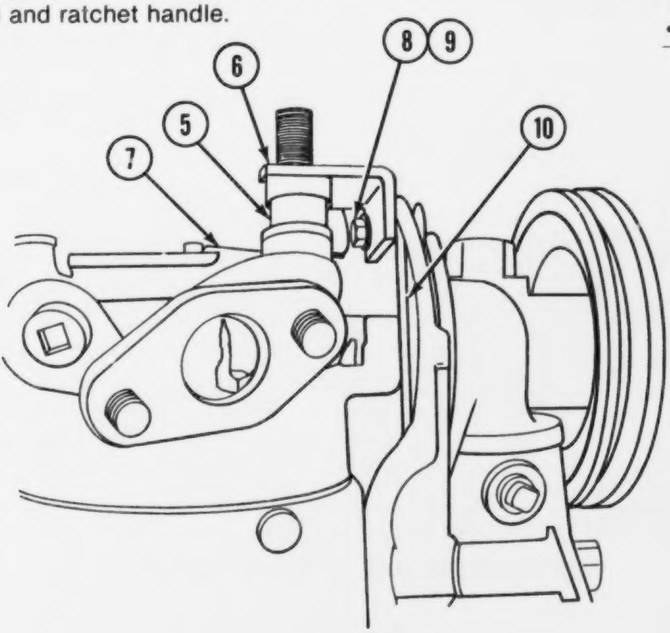
## B. INSTALLATION — Continued

9. LUBRICATE ROCKER ARM ASSEMBLY.
   - Oil rocker arm assembly (1). Use hand oiler. Be sure to oil between eight rocker arms (2) and spacers (3), and between eight rocker arms and valve stems (4).

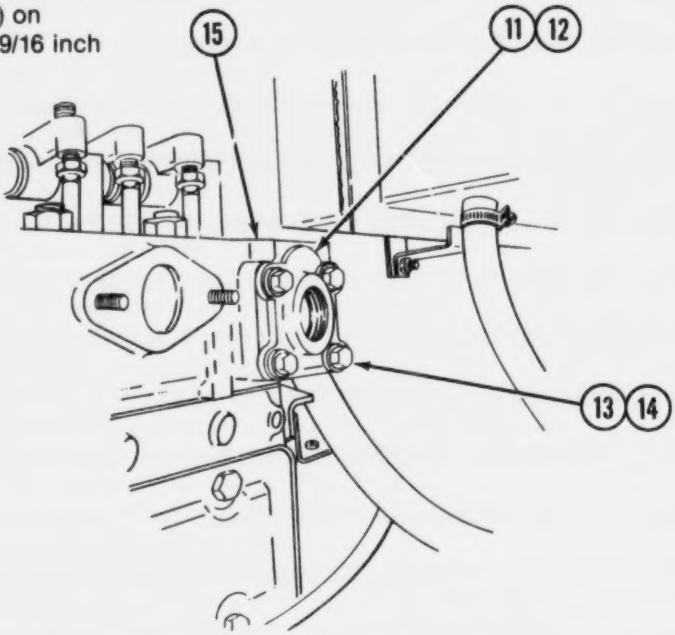


10. INSTALL WATER PUMP BRACKET ON ENGINE BLOCK.
    - Position flat washer (5) and bracket (6) on engine block (7) with mounting holes alined.
    - Install new lock washer (8) and screw (9) on water pump (10). Use 1/2 inch socket with 5 inch extension and ratchet handle.





11. INSTALL WATER OUTLET COVER ON CYLINDER HEAD ASSEMBLY.
    - Install new gasket (11), cover (12), four new lock washers (13), and screws (14) on cylinder head assembly (15). Use 9/16 inch box end wrench.



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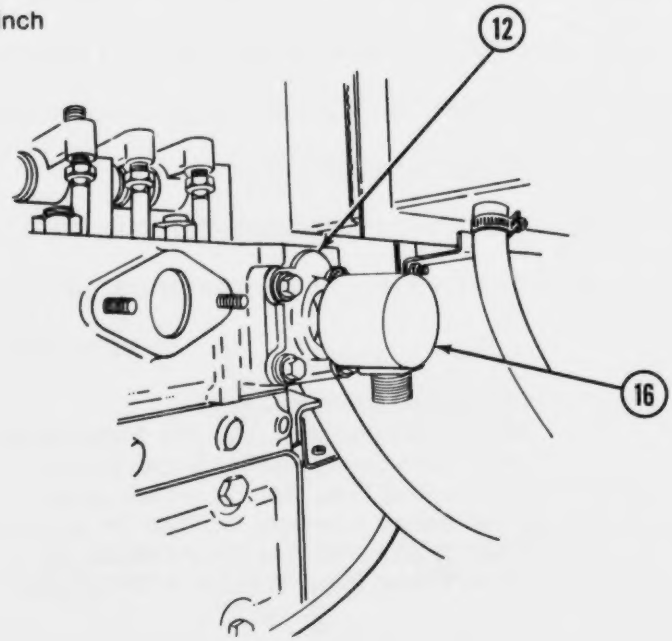
12. INSTALL COLD START THERMOSTATIC SWITCH ON WATER OUTLET COVER.
    - Apply sealing compound to threads of switch (16).
    - Install switch (16) on cover (12). Use 1 inch open end wrench.



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**B. INSTALLATION — Continued**

13. INSTALL COLD START THERMOSTAT CABLE ON ENGINE. (SEE TM 9-1095-205-20.)

14. ADJUST VALVE CLEARANCE. (SEE TM 9-1095-205-20.)

15. INSTALL VALVE COVER ON DISPENSER. (SEE TM 9-1095-205-20.)

16. INSTALL AIR INTAKE PIPE ON DISPENSER. (SEE TM 9-1095-205-20.)

17. INSTALL AIR FILTER HOUSING ON DISPENSER. (SEE TM 9-1095-205-20.)

18. INSTALL AIR CLEANER FILTER ELEMENT ON DISPENSER. (SEE TM 9-1095-205-20.)

19. INSTALL EXHAUST MANIFOLD ON DISPENSER. (SEE EXHAUST MANIFOLD, PAGE 15-23.)

20. INSTALL MUFFLER AND PROTECTIVE CAP ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

21. INSTALL THERMOSTAT HOUSING ON DISPENSER. (SEE TM 9-1095-205-20.)

22. INSTALL BYPASS HOSE ON DISPENSER. (SEE TM 9-1095-205-20.)

23. INSTALL FOUR FUEL NOZZLE ASSEMBLIES ON DISPENSER. (SEE FUEL NOZZLE ASSEMBLIES, PAGE 15-187.)

24. FILL RADIATOR. (SEE TM 9-1095-205-20.)

25. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)

26. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

27. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

28. START ENGINE. (SEE TM 9-1095-205-20.) RUN ENGINE FOR 1 HOUR.

29. STOP ENGINE. (SEE TM 9-1095-205-20.)

30. REMOVE VALVE COVER FROM DISPENSER. (SEE TM 9-1095-205-20.)

31. TORQUE 14 CYLINDER HEAD MOUNTING NUTS. (SEE CYLINDER HEAD ASSEMBLY, PAGE 15-227.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Adjust Valve Clearance. (See TM 9-1095-205-20.)
Install Valve Cover. (See TM 9-1095-205-20.)
Install Lifting Eyes. (See TM 9-1095-205-20.)
Install Engine Assembly Top. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Install Hinged Panel. (See TM 9-1095-205-20.)

## C. CYLINDER HEAD DISASSEMBLY

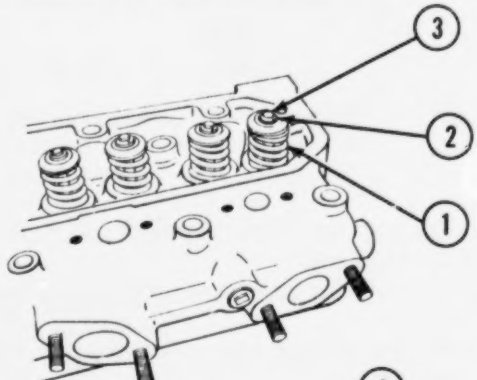
### NOTE

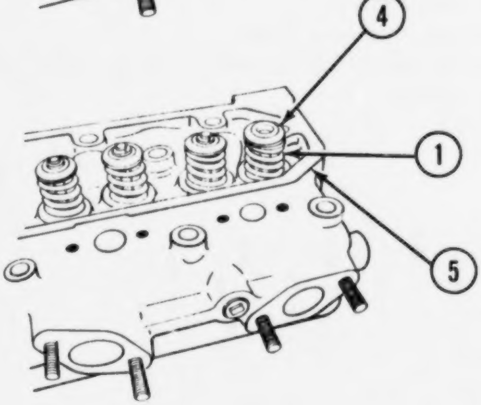
***PRELIMINARY PROCEDURES:***

Remove Hinged Panel. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Lifting Eyes. (See TM 9-1095-205-20.)
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Close Fuel Shutoff Valve. (See TM 9-1095-205-10.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Fuel Nozzle Assemblies. (See Fuel Nozzle Assemblies, Page 15-187.)
Remove Bypass Hose. (See TM 9-1095-205-20.)
Remove Thermostat Housing. (See TM 9-1095-205-20.)
Remove Muffler And Protective Cap Assembly. (See TM 9-1095-205-20.)
Remove Exhaust Manifold. (See Exhaust Manifold, Page 15-23.)
Remove Air Cleaner Filter Element. (See TM 9-1095-205-20.)
Remove Air Filter Housing. (See TM 9-1095-205-20.)
Remove Air Intake Pipe. (See TM 9-1095-205-20.)
Remove Valve Cover. (See TM 9-1095-205-20.)
Remove Rocker Arm Assembly. (See Rocker Arm Assembly, Page 15-199.)
Remove Cold Start Thermostat Cable Assembly. (See TM 9-1095-205-20.)

1. REMOVE CYLINDER HEAD ASSEMBLY FROM DISPENSER. (SEE CYLINDER HEAD ASSEMBLY, PAGE 15-220.)

2. REMOVE EIGHT VALVE SPRINGS FROM CYLINDER HEAD ASSEMBLY.
   - Compress valve spring (1) until you can reach two valve spring seat locks (2). Use valve spring lifter.
   - Remove two valve spring seat locks (2) from valve stem (3). Use round nose pliers.
   - Slowly release and remove valve spring lifter.
   - Remove valve spring seat (4) and valve spring (1) from cylinder head assembly (5).
   - Repeat above removal steps for other seven valve springs.





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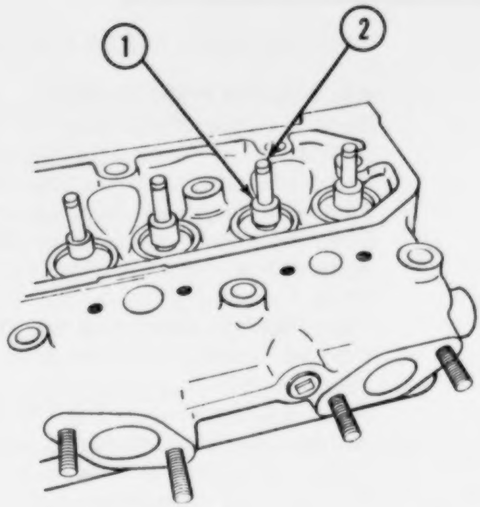
## C. CYLINDER HEAD DISASSEMBLY — Continued

**NOTE**

Exhaust valves do not have valve stem seals.

3. REMOVE FOUR VALVE STEM SEALS (1) FROM FOUR INTAKE VALVES (2). DISCARD VALVE STEM SEALS.



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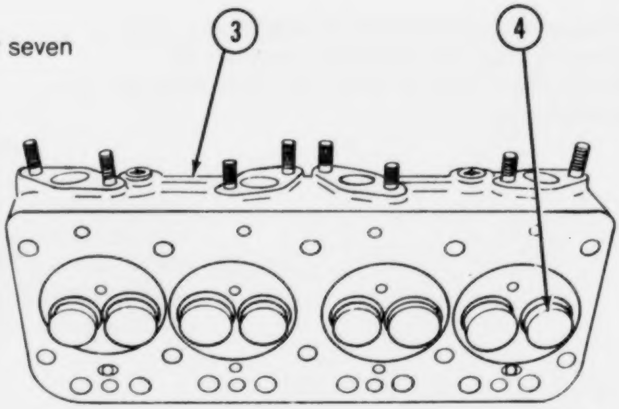
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

Engine can be damaged unless each valve is installed in position from which it was removed. Keep valves in order. Tag and mark each valve as it is removed from cylinder head.

4. REMOVE EIGHT VALVES FROM CYLINDER HEAD ASSEMBLY.
   - Turn cylinder head assembly (3) over. Use helper.
   - Remove valve (4) from cylinder head assembly (3).
   - Tag and mark valve.
   - Repeat above removal steps for other seven valves.



## D. CLEANING

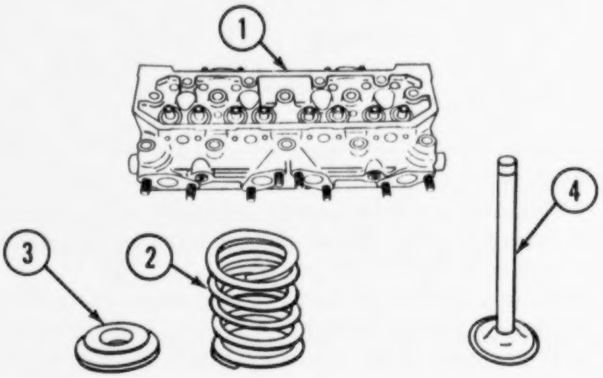
**WARNING**

Compressed air can hurt you. Never aim air at soldiers or use more pressure than 30 psi (207 kPa). Always wear goggles.

• • • •

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

1. CLEAN CYLINDER HEAD AND PARTS.
   - Turn cylinder head (1) over.
   - Remove grease from cylinder head (1), eight valve springs (2), valve spring seats (3), and valves (4). Use degreaser.
   - Dry cylinder head (1), eight valve springs (2), valve spring seats (3), and valves (4). Use air compressor and blow gun.
   - Blow air through all openings in cylinder head (1). Use air compressor and blow gun.



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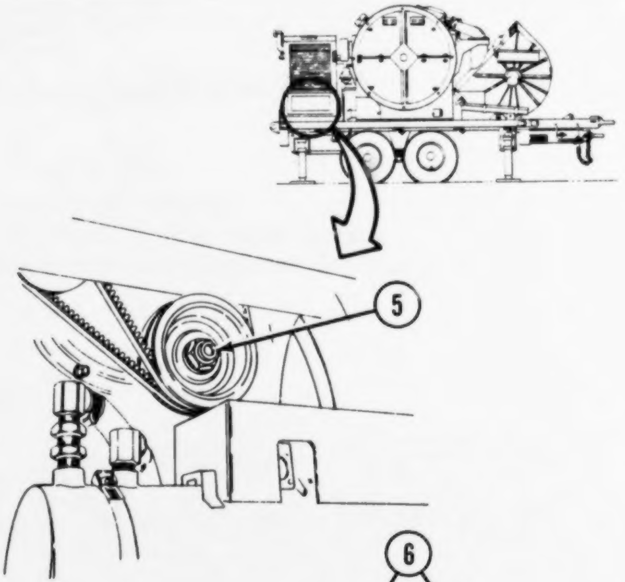
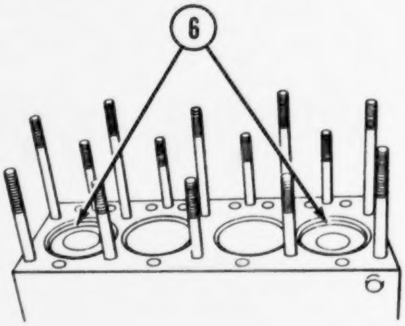
**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

2. REMOVE CARBON DEPOSITS FROM FOUR PISTONS.
   - Turn crankshaft nut (5) until two pistons (6) are at top of engine. Use 1 5/16 inch socket with 3/4 inch drive sliding tee handle.
   - Remove carbon deposits from two pistons (6). Use carbon scraper and wire brush with drill motor.
   - Blow loose carbon away from four pistons (6). Use air compressor and blow gun.
   - Repeat above removal steps for other two pistons.





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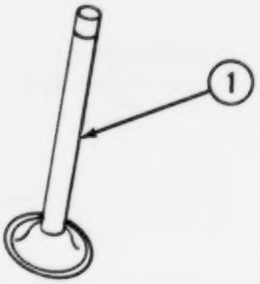
**D. CLEANING — Continued**

3. REMOVE CARBON DEPOSITS FROM EIGHT VALVES.
   - Remove carbon deposits from eight valves (1). Use utility grinding machine with wire brush and arbor adapter.
   - Blow loose carbon away from eight valves (1). Use air compressor and blow gun.



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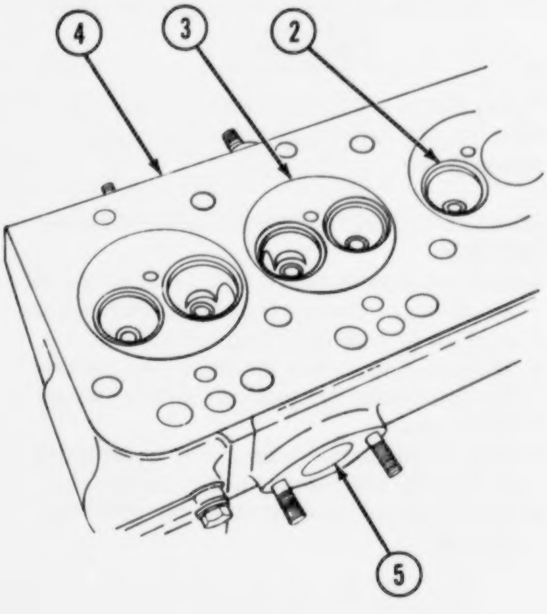
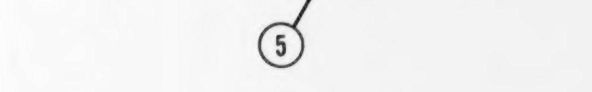
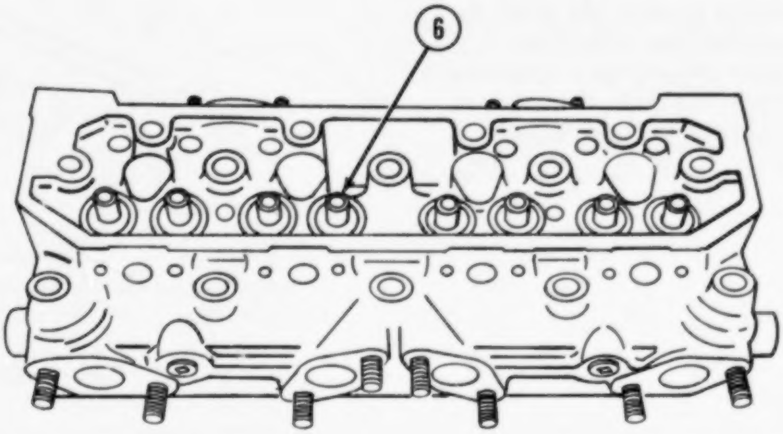
4. REMOVE CARBON DEPOSITS FROM CYLINDER HEAD.
   - Remove carbon deposits from eight valve seats (2). Use wire brush with drill motor.
   - Remove carbon deposits from four combustion areas (3) in cylinder head (4). Use carbon scraper and wire brush with drill motor.
   - Blow loose carbon away from cylinder head (4). Use air compressor and blow gun.
   - Remove carbon deposits from four exhaust ports (5). Use wire brush with drill motor.
   - Blow loose carbon away from four exhaust ports (5). Use air compressor and blow gun.





5. CLEAN EIGHT VALVE GUIDES.
    - Clean eight valve guides (6). Use bore brush with drill motor.
    - Blow loose carbon away from eight valve guides (6). Use air compressor and blow gun.



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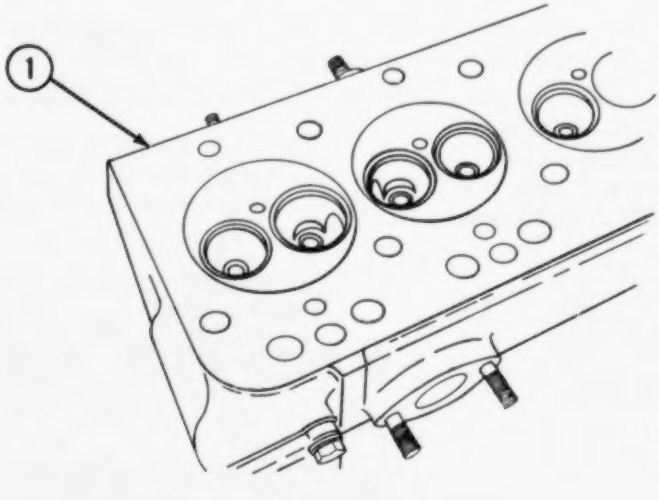
**E. INSPECTION**

**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

1. INSPECT CYLINDER HEAD CONTACT SURFACE.
    - Check that contact surface of cylinder head (1) is clean and smooth.
    - Polish light scratches on contact surface of cylinder head (1). Use orbital sander.
    - If contact surface of cylinder head (1) is pitted, cracked, or scratched, cylinder head is faulty.



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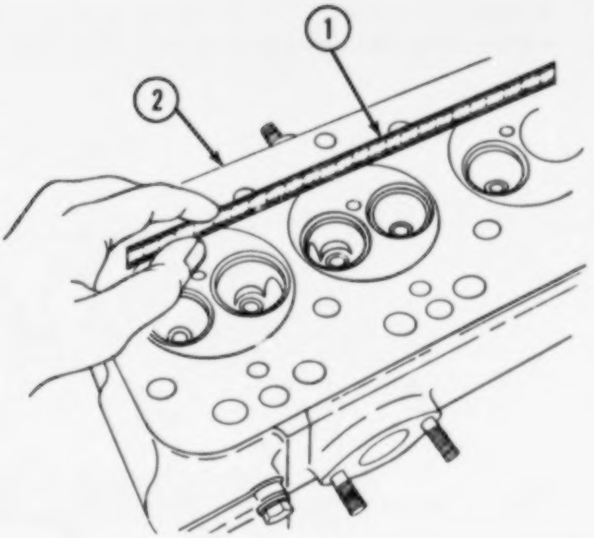
**E. INSPECTION — Continued**

2. INSPECT CYLINDER HEAD FOR FLATNESS.
   - Place machinist's rule (1) on edge of contact surface of cylinder head (2). Move rule along contact surface, and check for gaps under edge of machinist's rule.
   - Measure all gaps under edge of machinist's rule (1). Use thickness gage. If any gap is over 0.005 in. (0.127 mm), cylinder head is faulty.



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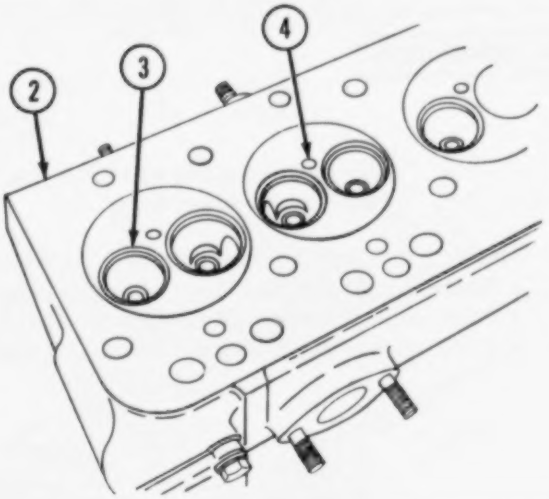
3. CHECK CYLINDER HEAD FOR CRACKS.
   - Check outside surfaces of cylinder head (2), eight valve areas (3), and four fuel injection ports (4) for cracks. If there are any cracks, cylinder head is faulty.



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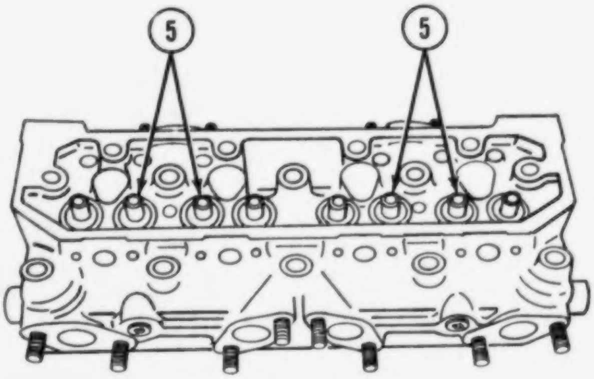
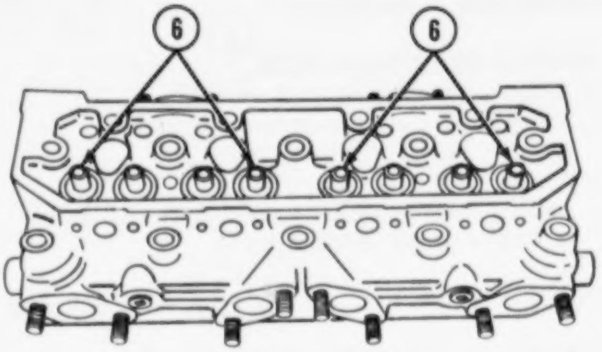
4. INSPECT FOUR INTAKE VALVE GUIDES.
   - Measure bore diameter of intake valve guides (5). Use vernier caliper. If bore diameter is more than 0.378 in. (9.60 mm), valve guide is faulty.



5. INSPECT FOUR EXHAUST VALVE GUIDES.
   - Measure bore diameter of exhaust valve guides (6). Use vernier caliper. If bore diameter is more than 0.379 in. (9.63 mm) valve guide is faulty.



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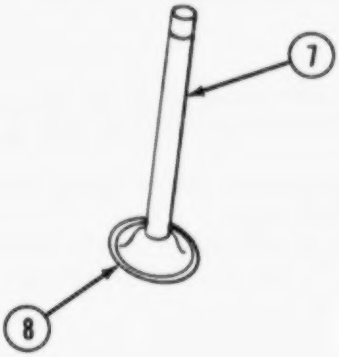
6. INSPECT EIGHT VALVES.
   - Check eight valve stems (7) for bends by rolling each valve stem on smooth, flat surface. Valve with bent stem is faulty.
   - Check eight valve stems (7) for minor scratches and for cracks or pits. Polish scratched valve stem. Use crocus cloth. Valve with cracked or pitted stem is faulty.
   - Check diameter of eight valve stems (7). Use micrometer. Intake valve with stem diameter less than 0.3725 in. (9.46 mm) is faulty. Exhaust valve with stem diameter less than 0.3740 in. (9.50 mm) is faulty.
   - Check eight valve seating faces (8) for pits, peens, or scores. Valve with badly pitted, peened, or scored face is faulty.



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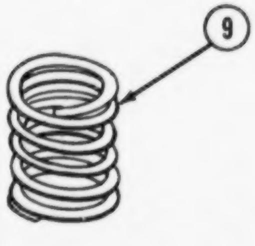
**NOTE**

When valve spring is compressed to 7.492 in. (37.90 mm), test load must weigh 45 — 51 lb (20.3 — 22.3 kg). When valve spring is compressed to 1.082 in. (27.43 mm), test load must weigh 130 — 144 lb (58.5 — 64.8 kg).

7. INSPECT EIGHT VALVE SPRINGS.
   - Test eight valve springs (9). Use spring tester, torque wrench, and vernier caliper. Weak valve spring is faulty.



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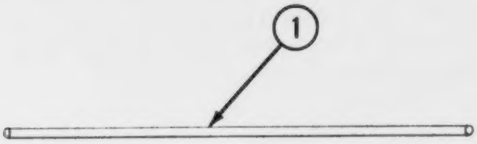
**E. INSPECTION — Continued**

8. INSPECT EIGHT PUSH RODS.
   - Check eight push rods (1) for bends by rolling each push rod on smooth, flat surface. Bent push rod is faulty.
   - Check eight push rods (1) for scores or flat spots on ball ends. Push rod with flat spots or scores on ball ends is faulty.



9. INSPECT ROCKER ARM ASSEMBLY. (SEE ROCKER ARM ASSEMBLY, PAGE 15-199.)

10. REFINISH VALVE SEATS. (SEE CYLINDER HEAD ASSEMBLY, PAGE 15-239.)

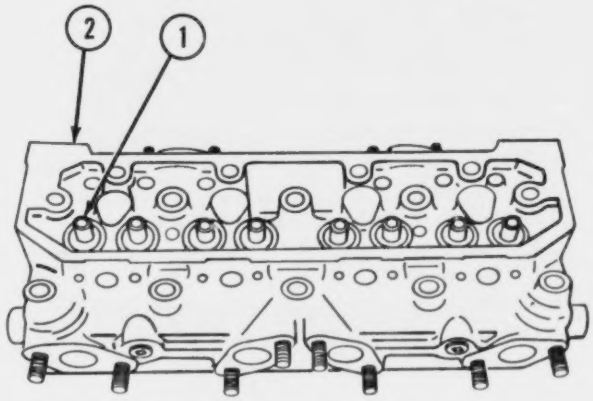
---

## F. VALVE GUIDE REPLACEMENT

**NOTE**

Valve guides are replaced the same way. Steps 1 and 2 show exhaust valve guide.

1. REMOVE FAULTY VALVE GUIDE FROM CYLINDER HEAD.
   - Remove faulty valve guide (1) from cylinder head (2). Use arbor press with 1/2 x 6 inch steel rod.



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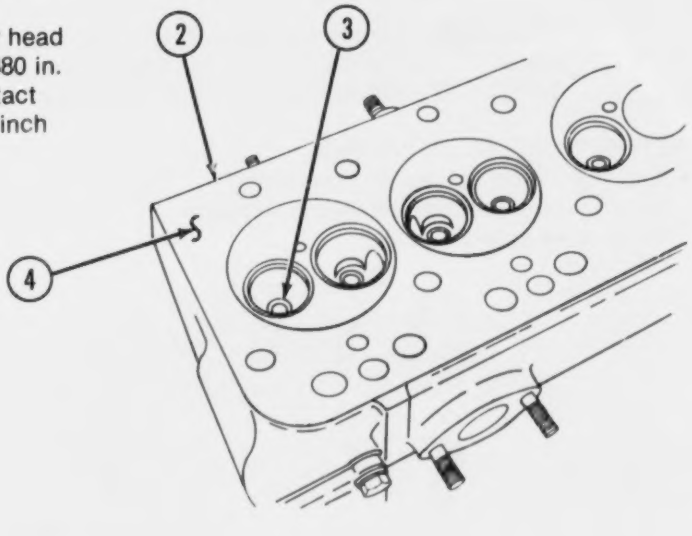
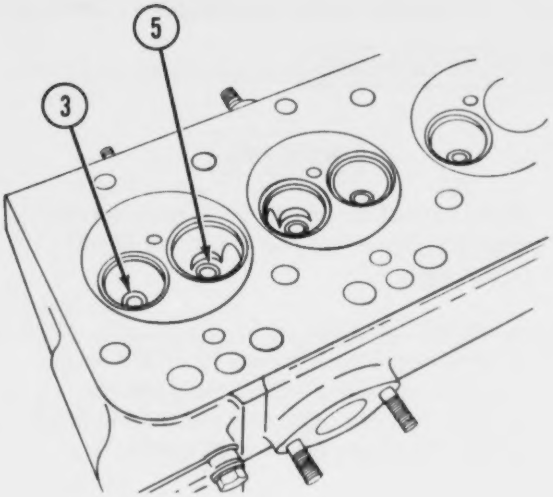
2. INSTALL NEW VALVE GUIDE IN CYLINDER HEAD.
   - Install new valve guide (3) in cylinder head (2), with lower face of valve guide 1.380 in. (35.05 mm) above cylinder head contact surface (4). Use arbor press, 1/2 x 6 inch steel rod, and depth gage.



**NOTE**

Intake valve guides and exhaust valve guides have different bore diameters, and require different reamers.

3. REAM VALVE GUIDE.
   - Ream exhaust valve guide (3) 0.375 — 0.376 in. (9.53 — 9.55 mm). Use suitable reamer and vernier caliper.
   - Ream intake valve guide (5) 0.374 — 0.375 in. (9.50 — 9.53 mm). Use suitable reamer and vernier caliper.



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## G. VALVE SEAT REFINISHING

**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

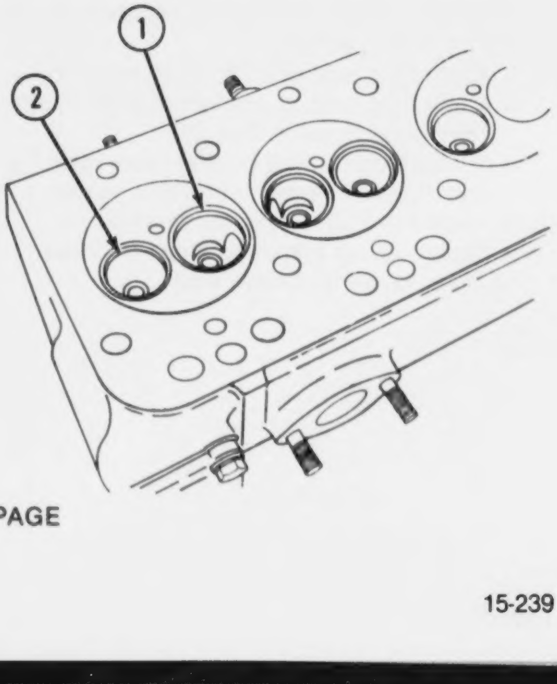
**CAUTION**

Valve seats can be damaged when new valve guides are installed. Install new valve guides before refinishing valve seats.

**NOTE**

Refinish valve seats with valve guides in place. Refinish intake valve seats at 30° angle. Refinish exhaust valve seats at 45° angle.

REFINISH EIGHT VALVE SEATS.
- Refinish four intake valve seats (1) at 30° angle. Use valve seat grinding kit with 3/8 inch pilot.
- Refinish four exhaust valve seats (2) at 45° angle. Use valve seat grinding kit with 3/8 inch pilot.
- Measure width of four intake valve seats (1) and four exhaust valve seats (2). Use vernier caliper. If width is more than 0.125 in. (3.18 mm), cylinder head is faulty.



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## 15-17 CYLINDER HEAD ASSEMBLY — Continued

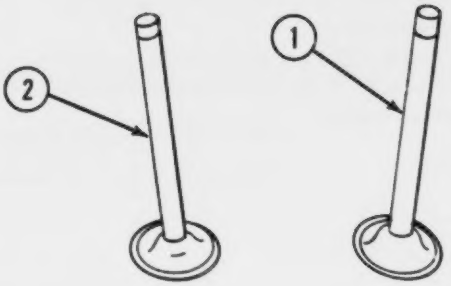
### H. VALVE GRINDING

**WARNING**

Flying bits of metal can blind you. Always wear goggles when you cut metal or use power tools.

GRIND EIGHT VALVES.

- Grind four intake valves (1) at 30° angle. Use valve face grinding machine.
- Grind four exhaust valves (2) at 45° angle. Use valve face grinding machine.



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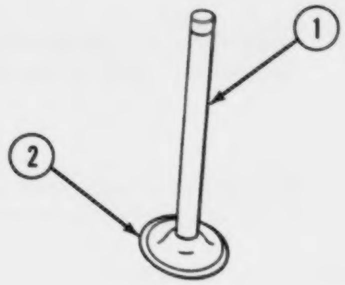
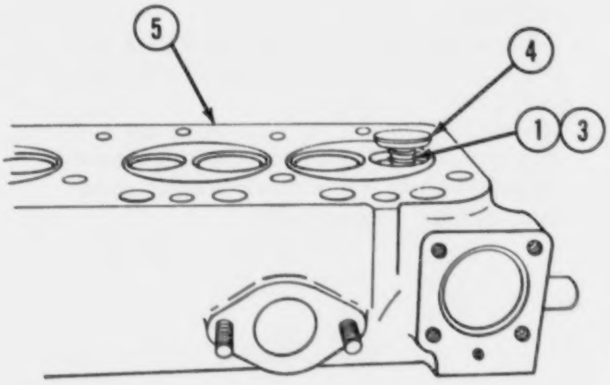
### I. VALVE SEATING

**CAUTION**

Engine can be damaged if each valve is not lapped in same valve seat from which it was removed. Lap each valve in same valve seat from which it was removed.

1. PREPARE EIGHT VALVE FACES AND VALVE SEATS FOR LAPPING.
   - Apply light coat of oil to valve stem (1).
   - Apply light coat of medium coarse lapping compound to valve face (2).
   - Put light coil spring (3) over valve stem (1). Use light coil spring from valve lapper.
   - Place valve (4) in cylinder head (5).
   - Repeat above preparing steps for other seven valves and valve seats.

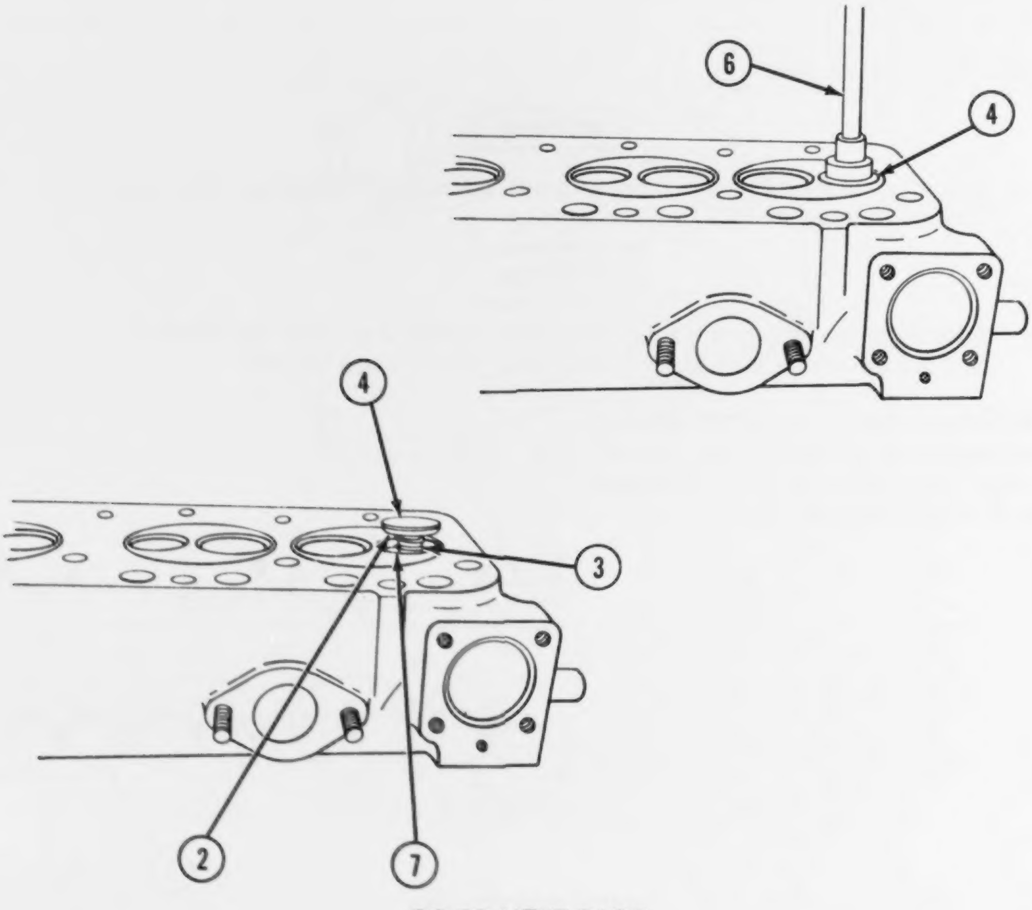




**CAUTION**

Turning valve in only one direction can put grooves in valve face or valve seat. Turn handle on valve lapper to right and to left.

2. LAP EIGHT VALVE FACES AND VALVE SEATS.
   - Press firmly on valve lapper (6). Turn valve (4) to right and to left a few times.
   - Lift valve lapper (6), and allow spring (3) to lift valve (4) from valve seat (7).
   - Turn valve (4) 15° — 20°.
   - Repeat above lapping steps several times.
   - Wipe lapping compound off valve (4) and valve seat (7). Use rag.
   - Check valve face (2) and valve seat (7) where they touch. You should see a gray band on valve face and on valve seat.
   - If you do not see a gray band, repeat above lapping steps until a gray band appears.
   - Apply light coat of medium coarse lapping compound to valve face (2) and valve seat (7).
   - Repeat above lapping steps until valve face (2) and valve seat (7) have even, gray bands.
   - Wipe lapping compound off valve (4) and valve seat (7). Use rag.
   - Repeat above lapping steps for other seven valve faces and valve seats.



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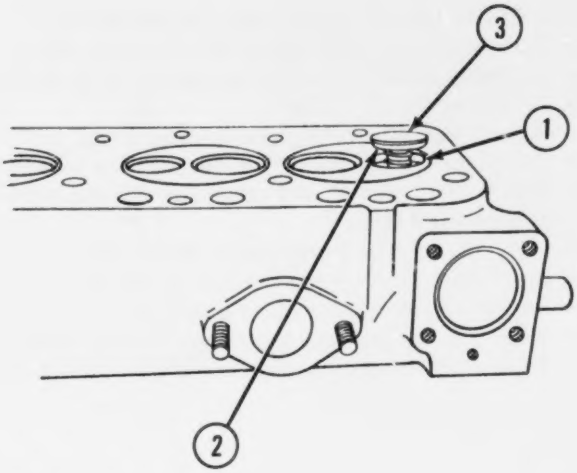
## I. VALVE SEATING — Continued

**WARNING**

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

3. POLISH EIGHT VALVE FACES AND VALVE SEATS.
   - Repeat step 2 until valve seat (1) and valve face (2) are each a bright silver band. Use fine lapping compound.
   - Clean lapping compound off valve (3) and valve seat (1). Use rag and solvent.
   - Dry valve (3) and valve seat (1). Use clean rag.
   - Repeat above polishing steps for other seven valve faces and valve seats.



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## J. CYLINDER HEAD REASSEMBLY

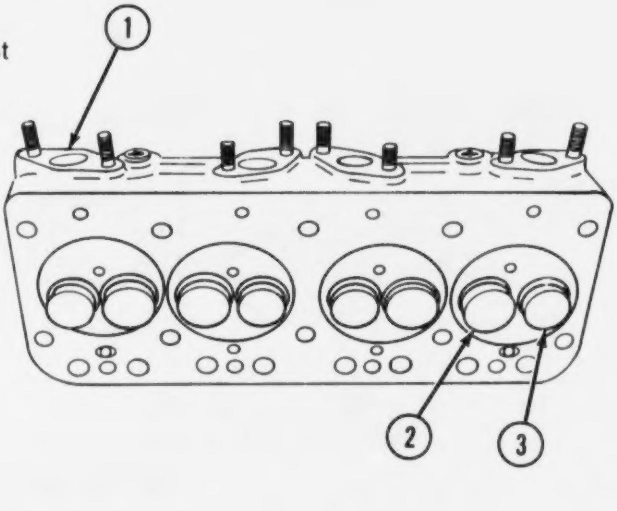
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

Engine can be damaged if each valve is not installed in valve seat where it was lapped. Install each valve in valve seat where it was lapped.

1. PLACE EIGHT VALVES IN CYLINDER HEAD.
   - Turn cylinder head (1) on side. Use helper.
   - Place four intake valves (2) and four exhaust valves (3) in cylinder head (1).



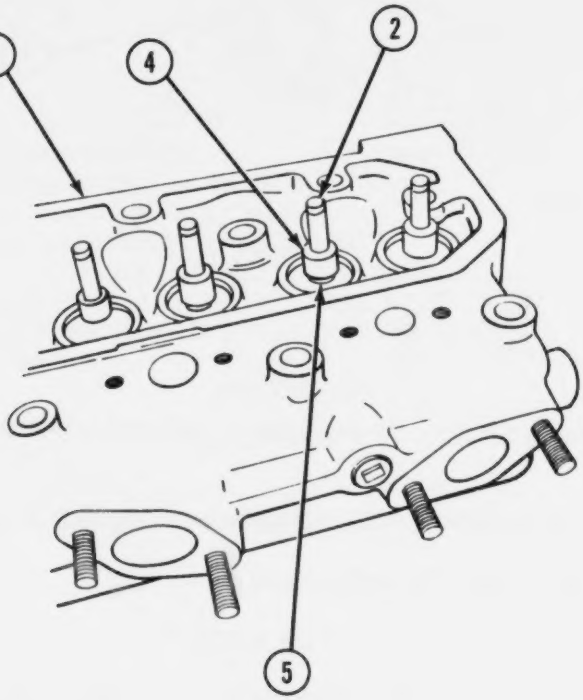
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**NOTE**

Exhaust valves do not have valve stem seals.

2. INSTALL FOUR NEW VALVE STEM SEALS ON FOUR INTAKE VALVES.
   - Turn cylinder head (1) over. Use helper.
   - Install four new valve stem seals (4) on four intake valves (2). Seat valve stem seals firmly on four valve guides (5).



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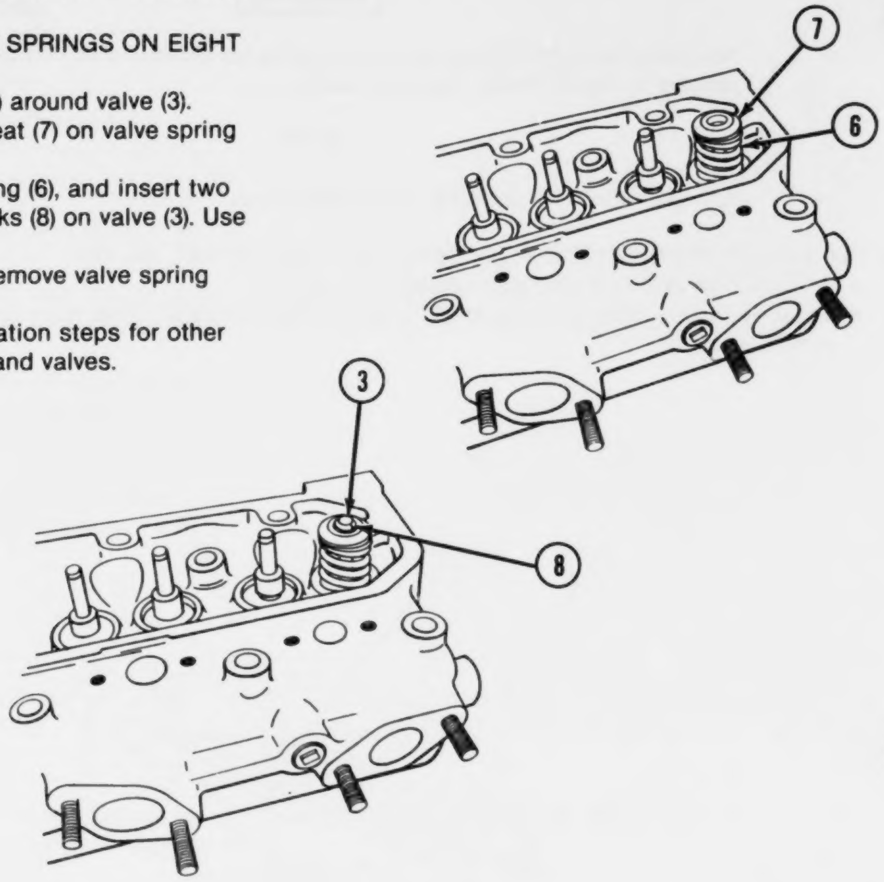
## J. CYLINDER HEAD REASSEMBLY — Continued

3. INSTALL EIGHT VALVE SPRINGS ON EIGHT VALVES.
   - Place valve spring (6) around valve (3).
   - Place valve spring seat (7) on valve spring (6).
   - Compress valve spring (6), and insert two valve spring seat locks (8) on valve (3). Use valve spring lifter.
   - Slowly release and remove valve spring lifter.
   - Repeat above installation steps for other seven valve springs and valves.



4. INSTALL CYLINDER HEAD ASSEMBLY ON DISPENSER. (SEE CYLINDER HEAD ASSEMBLY, PAGE 15-224.)

5. INSTALL COLD START THERMOSTAT CABLE ASSEMBLY ON ENGINE. (SEE TM 9-1095-205-20.)

6. ADJUST VALVE CLEARANCE. (SEE TM 9-1095-205-20.)

7. INSTALL VALVE COVER ON DISPENSER. (SEE TM 9-1095-205-20.)

8. INSTALL AIR INTAKE PIPE ON DISPENSER. (SEE TM 9-1095-205-20.)

9. INSTALL AIR FILTER HOUSING ON DISPENSER. (SEE TM 9-1095-205-20.)

10. INSTALL AIR CLEANER FILTER ELEMENT ON DISPENSER. (SEE TM 9-1095-205-20.)

11. INSTALL EXHAUST MANIFOLD ON DISPENSER. (SEE EXHAUST MANIFOLD, PAGE 15-23.)

12. INSTALL MUFFLER AND PROTECTIVE CAP ON DISPENSER. (SEE TM 9-1095-205-20.)

13. INSTALL THERMOSTAT HOUSING ON DISPENSER. (SEE TM 9-1095-205-20.)

14. INSTALL BYPASS HOSE ON DISPENSER. (SEE TM 9-1095-205-20.)
15. INSTALL FOUR FUEL NOZZLE ASSEMBLIES ON DISPENSER. (SEE FUEL NOZZLE ASSEMBLIES, PAGE 15-187.)
16. FILL RADIATOR. (SEE TM 9-1095-205-20.)
17. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)
18. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)
19. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)
20. START ENGINE. (SEE TM 9-1095-205-10.) RUN ENGINE FOR 1 HOUR.
21. STOP ENGINE. (SEE TM 9-1095-205-20.)
22. REMOVE VALVE COVER FROM DISPENSER. (SEE TM 9-1095-205-20.)
23. TORQUE 14 CYLINDER HEAD MOUNTING NUTS. (SEE CYLINDER HEAD ASSEMBLY, PAGE 15-227.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Adjust Valve Clearance. (See TM 9-1095-205-20.)
Install Valve Cover. (See TM 9-1095-205-20.)
Install Lifting Eyes. (See TM 9-1095-205-20.)
Install Engine Assembly Top. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Install Hinged Panel. (See TM 9-1095-205-20.)

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END OF TASK

## 15-18 OIL PAN ASSEMBLY

### DESCRIPTION

This task covers:
A. OIL PAN ASSEMBLY, GASKET, AND SEALS REMOVAL (p 15-247)
B. OIL PAN ASSEMBLY, GASKET, AND SEALS INSTALLATION (p 15-252)

### INITIAL SETUP

***Tools and Special Tools:***

- General mechanic's tool kit 5180-00-177-7033:
  - 9/16 inch open end wrench (2)
  - 9/16 inch box end wrench
  - 3/4 inch socket
  - 9/16 inch socket
  - 5 inch extension
  - Ratchet handle
  - 1/4 inch hex key
  - Pocket knife
  - Putty knife
- Torque wrench 5120-00-221-7950

***Materials/Parts:***

- Adhesive sealant, Item 2, Appendix B
- Self-locking nut (4) 5310-00-087-4652
- Gasket 5330-00-678-3821
- Seal (2) 5330-00-649-8437
- Lock washer (20) 5310-01-133-7241
- Self-locking screw 5306-01-031-1434
- Lock washer (2) 5310-00-582-5965
- Solvent, Item 28, Appendix B
- Rags, Item 22, Appendix B
- Lubricating Oil (see LO 9-1095-205-12), Item 16, Appendix B

***Personnel Required:***

- Mechanic
- Helper

***References:***

- LO 9-1095-205-12
- TM 9-1095-205-10
- TM 9-1095-205-20

### A. OIL PAN ASSEMBLY, GASKET, AND SEALS REMOVAL

**NOTE**

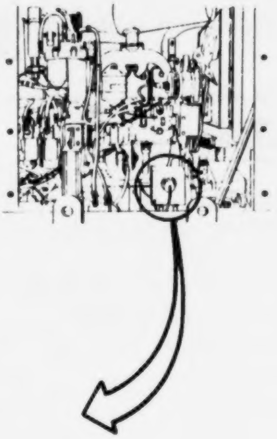
***PRELIMINARY PROCEDURES:***

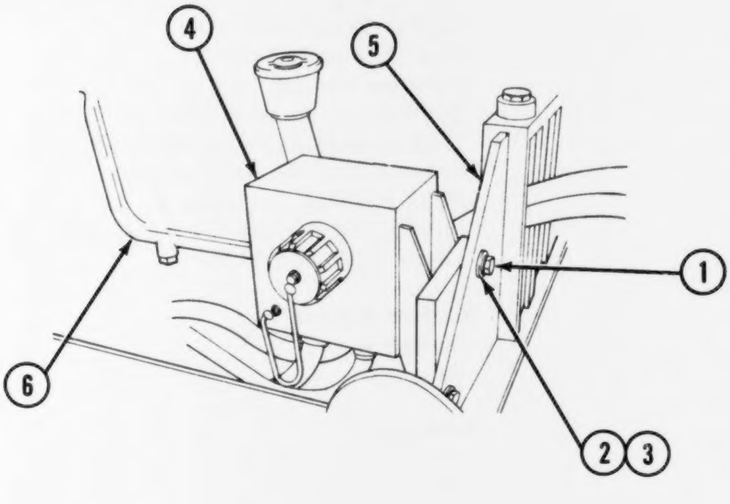
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)
Remove Engine Fixed Panel Support. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Starter. (See TM 9-1095-205-20.)
Drain Engine Oil. (See LO 9-1095-205-12.)

GO TO NEXT PAGE

### A. OIL PAN ASSEMBLY, GASKET, AND SEALS REMOVAL — Continued

1. REMOVE NATO RECEPTACLE ELECTRICAL ASSEMBLY FROM SUPPORT BRACKET.
   - Remove two screws (1), lock washers (2), washers (3), and NATO receptacle (4) from support bracket (5). Use 3/4 inch socket with ratchet handle. Discard lock washers.
   - Swing NATO receptacle (4) away from oil pan (6).





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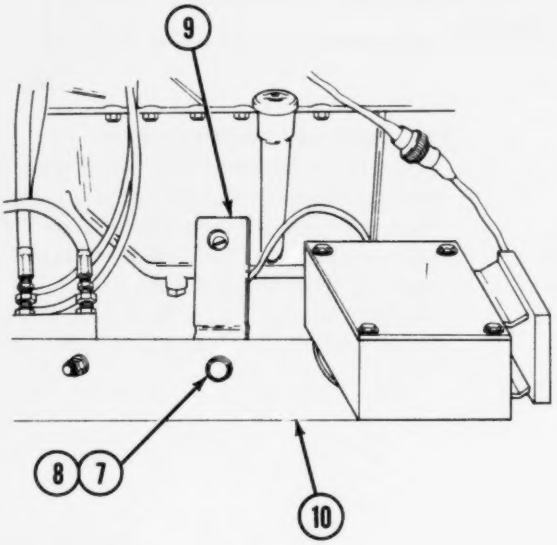
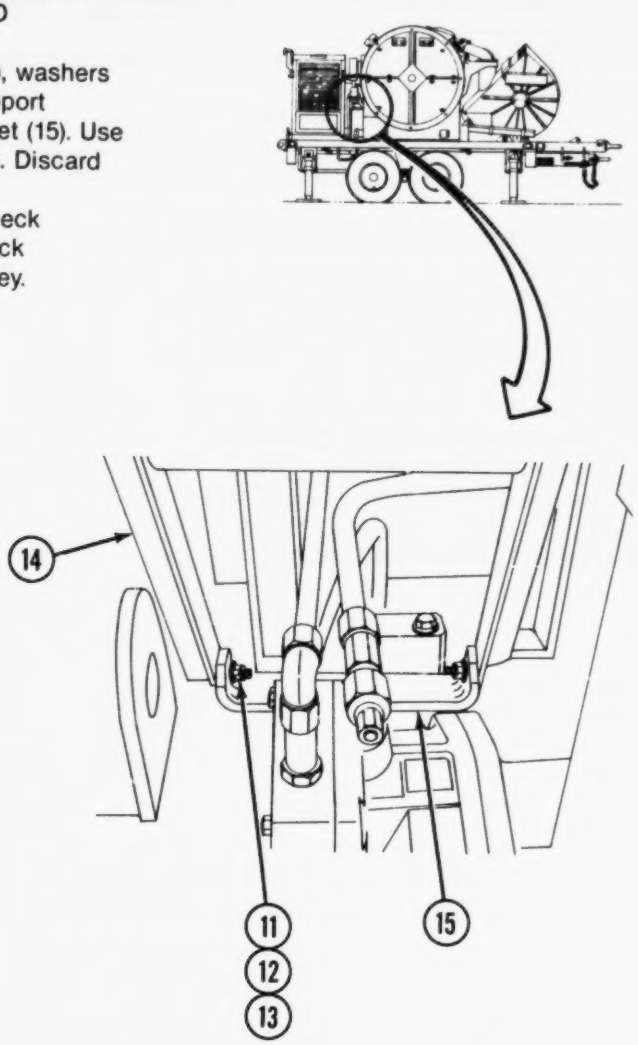
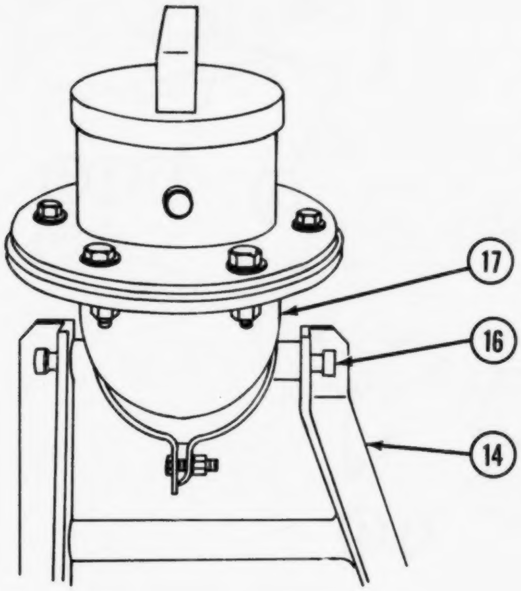
2. REMOVE ENGINE HINGED PANEL SUPPORT FROM ENGINE ASSEMBLY PALLET.
   - Remove self-locking screw (7), washer (8), and panel support (9) from engine pallet (10). Use 3/4 inch socket with ratchet handle. Discard self-locking screw.



3. REMOVE FILL NECK SUPPORT ASSEMBLY FROM FILL NECK EXTENSION AND SUPPORT BRACKET.
   - Remove two self-locking nuts (11), washers (12), screws (13), and fill neck support assembly (14) from support bracket (15). Use two 9/16 inch open end wrenches. Discard self-locking nuts.
   - Remove two screws (16) and fill neck support assembly (14) from fill neck extension (17). Use 1/4 inch hex key.





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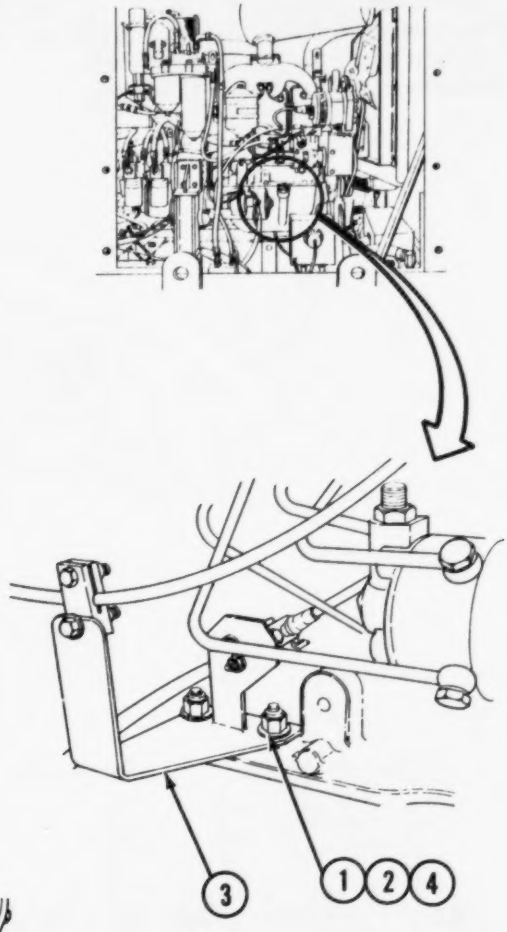
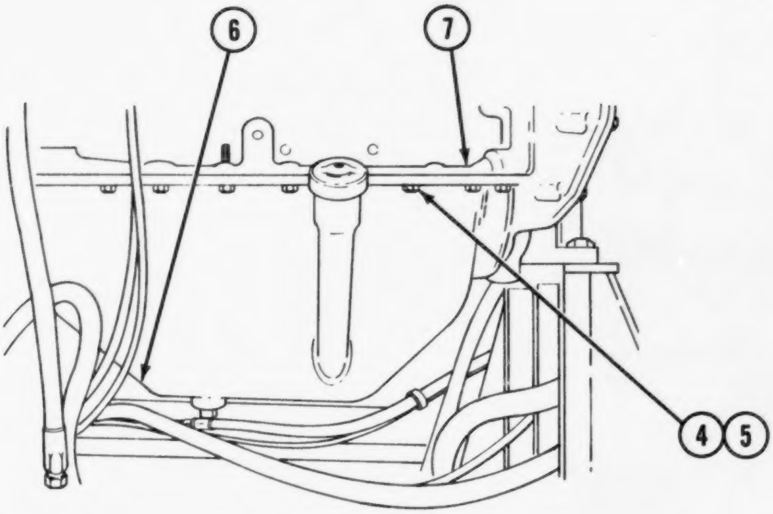
## A. OIL PAN ASSEMBLY, GASKET, AND SEALS REMOVAL — Continued

**CAUTION**

Oil pan flange can be damaged if oil pan falls. Support oil pan while removing from cylinder block.

4. REMOVE OIL PAN ASSEMBLY FROM ENGINE CYLINDER BLOCK.
   - Remove two self-locking nuts (1), washers (2), and cable control bracket (3) from two screws (4). Use 9/16 inch box end wrench. Discard self-locking nuts.
   - Remove 20 screws (4), lock washers (5), and oil pan (6) from cylinder block (7). Use 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers. Use helper.
   - Remove oil pan (6) from dispenser.

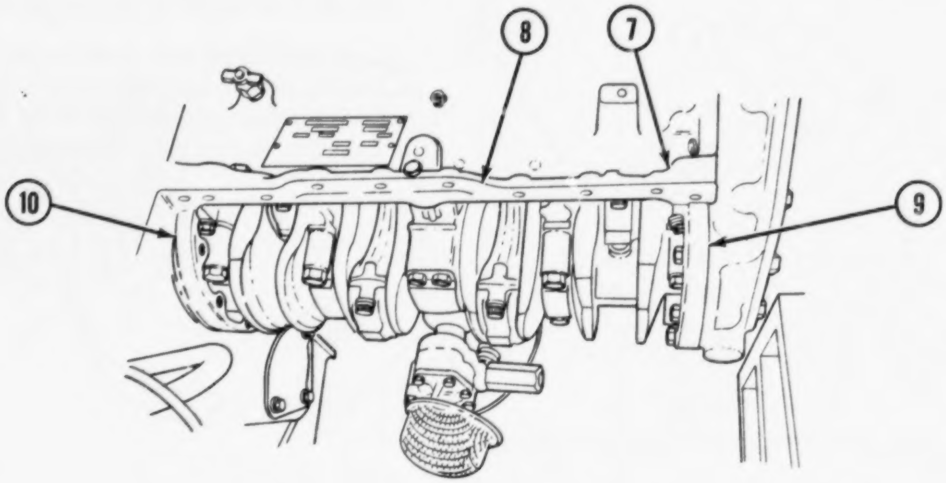




**WARNING**

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

5. REMOVE OIL PAN GASKET FROM ENGINE CYLINDER BLOCK.
   - Cut oil pan gasket (8) on each side of cylinder block (7) at front adapter (9) and rear adapter (10). Use pocket knife.
   - Remove oil pan gasket (8) from cylinder block (7). Use putty knife, solvent, and rags. Discard gasket.



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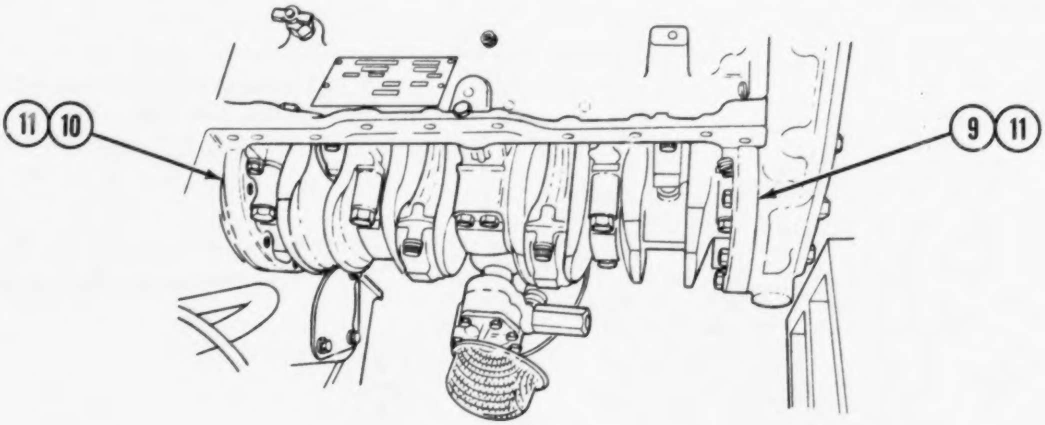
6. REMOVE TWO OIL PAN ASSEMBLY END SEALS FROM FRONT AND REAR ADAPTERS.
   - Remove oil pan end seals (11) from front adapter (9) and rear adapter (10). Use putty knife, solvent, and rags. Discard seals.



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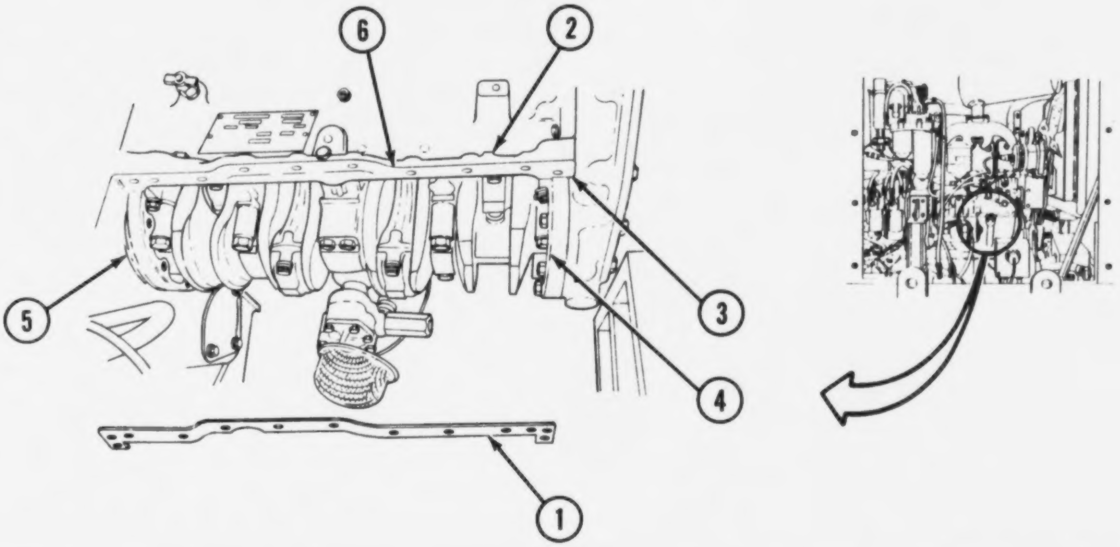
## 15-18 OIL PAN ASSEMBLY — Continued

### B. OIL PAN ASSEMBLY, GASKET, AND SEALS INSTALLATION

1. INSTALL NEW GASKET ON ENGINE CYLINDER BLOCK.
   - Aline mounting holes in new gasket (1) with mounting holes in cylinder block (2). Use helper.
   - Cut ends of gasket (1) to fit against ends of old gasket (3) under front adapter (4) and rear adapter (5). Use pocket knife.
   - Apply gasket adhesive to cylinder block mating surface (6) and ends of old gasket (3).
   - Install gasket (1) on cylinder block mating surface (6) with ends of gasket (1) contacting ends of old gasket (3).



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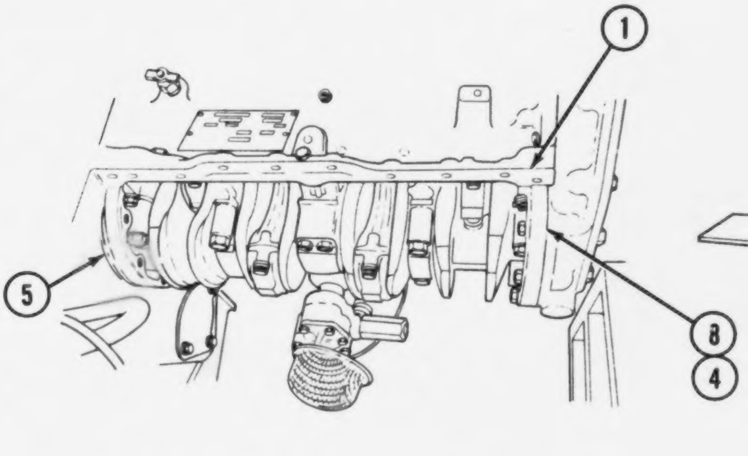
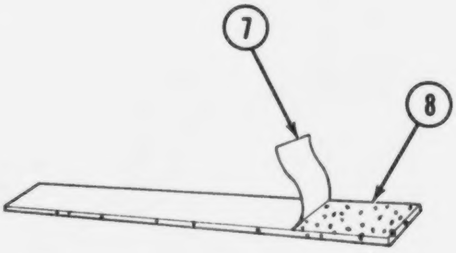
2. INSTALL TWO NEW OIL PAN ASSEMBLY END SEALS ON FRONT AND REAR ADAPTERS.
   - Remove protective cover (7) from two new seals (8). Discard protective covering.
   - Install two seals (8) on front adapter (4) and rear adapter (5). Make sure both ends of seals contact oil pan gasket (1).

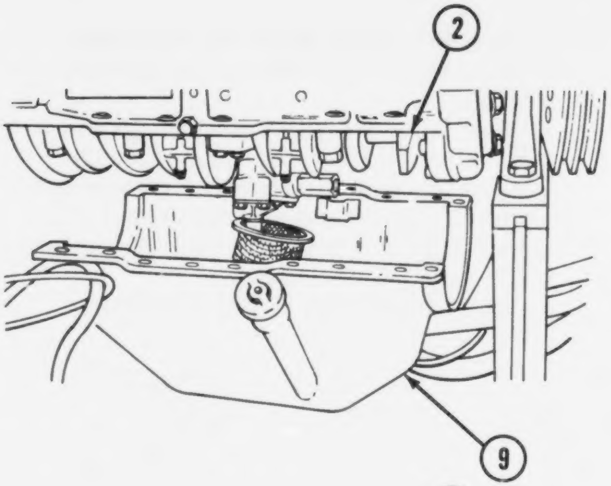


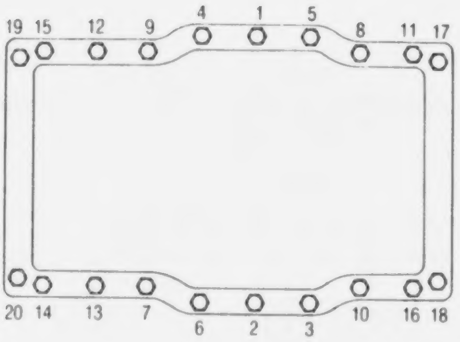


**CAUTION**

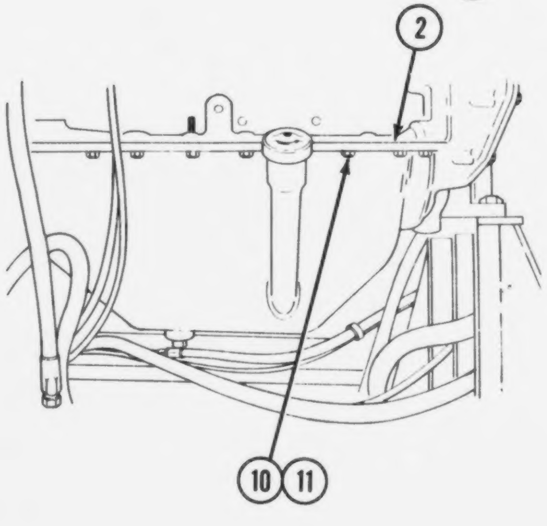
Oil pan flange can be damaged if oil pan falls. Support oil pan while installing on cylinder block.

3. INSTALL OIL PAN ASSEMBLY ON ENGINE CYLINDER BLOCK.
   - Position oil pan (9) under cylinder block (2).
   - Install oil pan (9), 20 new lock washers (10), and screws (11) on cylinder block (2). Use helper.
   - Torque 20 screws (11) to 20 ft lbs (2.8 mkg) starting from center of each side of oil pan (9). (See following Torquing Sequence.) Use 9/16 inch socket with 5 inch extension and torque wrench.





*Torquing Sequence*



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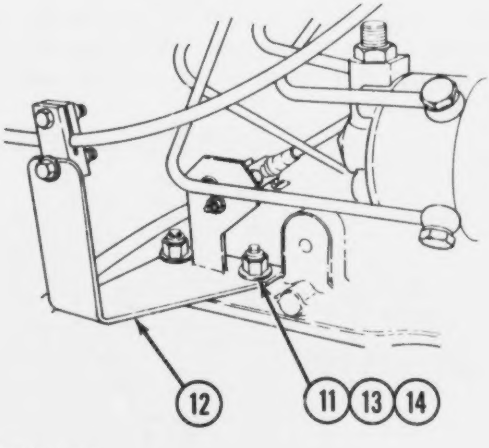
- Install cable control bracket (12), two washers (13), and new self-locking nuts (14) on two screws (11). Use 9/16 inch box end wrench.



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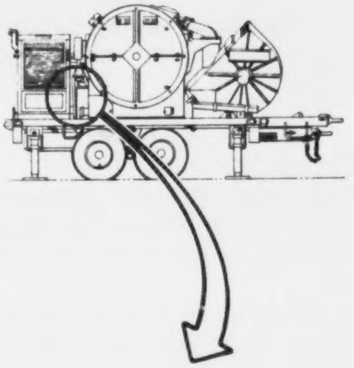
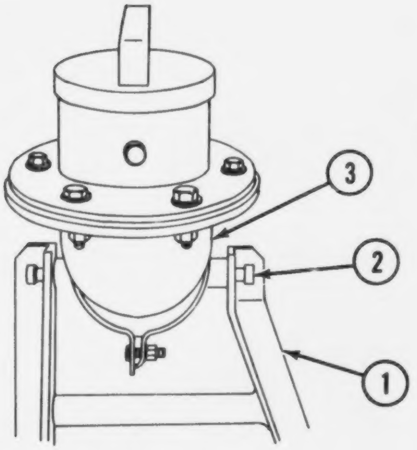
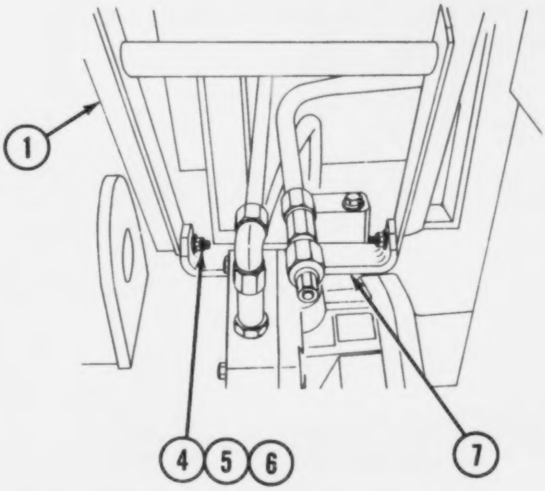
## B. OIL PAN ASSEMBLY, GASKET, AND SEALS INSTALLATION — Continued

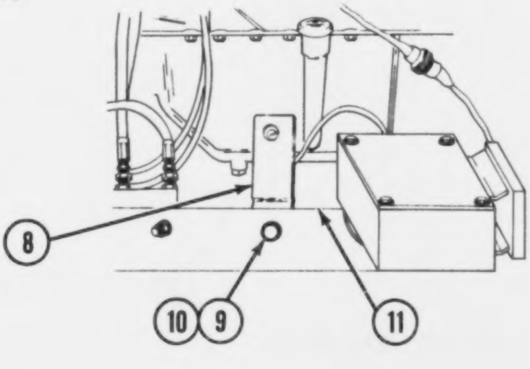
4. INSTALL FILL NECK SUPPORT ASSEMBLY ON FILL NECK EXTENSION AND SUPPORT BRACKET.
   - Install fill neck support assembly (1) and two screws (2) on fill neck extension (3).
   - Install two screws (4), washers (5), new self-locking nuts (6), and fill neck support assembly (1) on support bracket (7). Use two 9/16 inch open end wrenches.
   - Tighten two screws (2). Use 1/4 inch hex key.

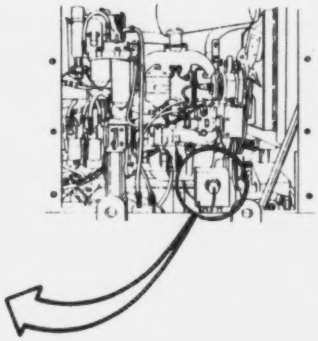




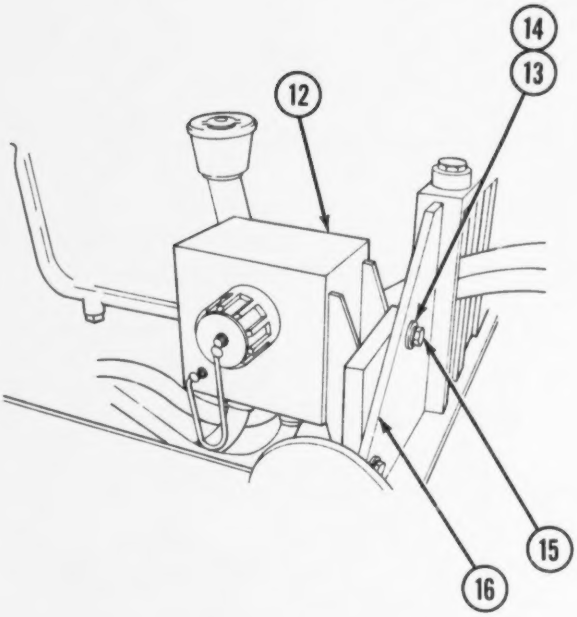


5. INSTALL ENGINE HINGED PANEL SUPPORT ON ENGINE PALLET ASSEMBLY SUPPORT.
   - Install hinged panel support (8), washer (9), and new self-locking screw (10) on engine pallet support (11). Use 3/4 inch socket with ratchet handle.





6. INSTALL NATO RECEPTACLE ELECTRICAL ASSEMBLY ON SUPPORT BRACKET.
   - Install NATO receptacle (12), two washers (13), new lock washers (14), and screws (15) on support bracket (16). Use 3/4 inch socket with ratchet handle.
7. FILL ENGINE CRANKCASE. (SEE LO 9-1095-205-12.)
8. INSTALL STARTER ON DISPENSER. (SEE TM 9-1095-205-20.)
9. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)
10. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)
11. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.
12. STOP ENGINE. (SEE TM 9-1095-205-20.)
13. CHECK OIL LEVEL. (SEE TM 9-1095-205-10.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Engine Fixed Panel Support. (See TM 9-1095-205-20.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)

---

END OF TASK

## 15-19 FRONT ENGINE SUPPORT

### DESCRIPTION

This task covers: A. REMOVAL (p 15-257)
B. INSTALLATION (p 15-258)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
  5180-00-177-7033:
    15/16 inch box end wrench
    15/16 inch open end wrench
    1/4 inch pin punch
Soft faced hammer 5120-00-903-8555
16 inch pry bar 5120-00-224-1389

***Materials/Parts:***

Self-locking nut (2) 5310-00-269-4040

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
CRANKSHAFT PULLEY, Page 15-261

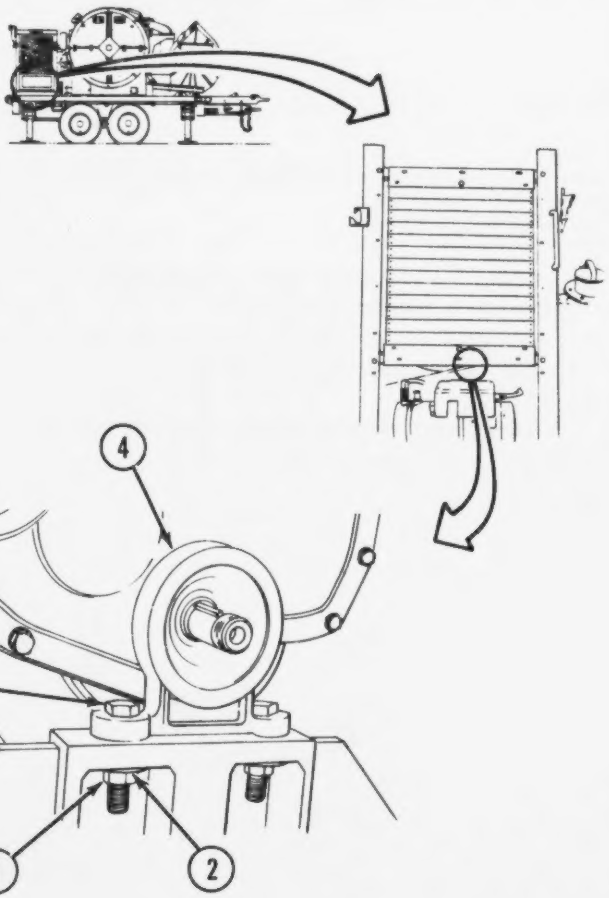
### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fan Belt And Alternator Drive Belt. (See TM 9-1095-205-20.)
Remove Engine Front Panel. (See TM 9-1095-205-20.)
Remove Crankshaft Pulley. (See Crankshaft Pulley, Page 15-261.)

1. REMOVE TWO MOUNTING SCREWS FROM FRONT ENGINE SUPPORT.
   - Remove two self-locking nuts (1), washers (2), and screws (3) from front engine support (4). Use 15/16 inch box end wrench and 15/16 inch open end wrench. Discard self-locking nuts.



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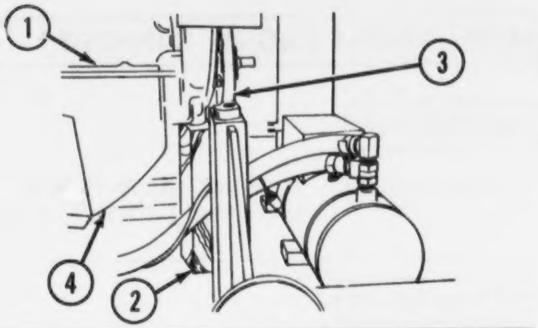
**A. REMOVAL — Continued**

2. POSITION WOOD BLOCK UNDER ENGINE.
   - Raise engine (1) just enough to install wood block (2) under engine. Use pry bar.
   - Position 11 in. (27.9 cm) length wood block (2) under engine (1) between front engine support (3) and engine oil pan (4).
   - Lower engine (1) onto wood block (2). Use pry bar.



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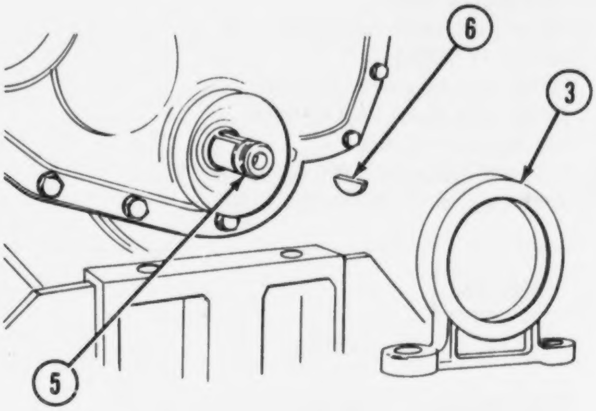
3. REMOVE FRONT ENGINE SUPPORT AND WOODRUFF KEY FROM SHAFT.
   - Remove front engine support (3) from shaft (5).
   - Remove woodruff key (6) from shaft (5). Use soft faced hammer and 1/4 inch pin punch.



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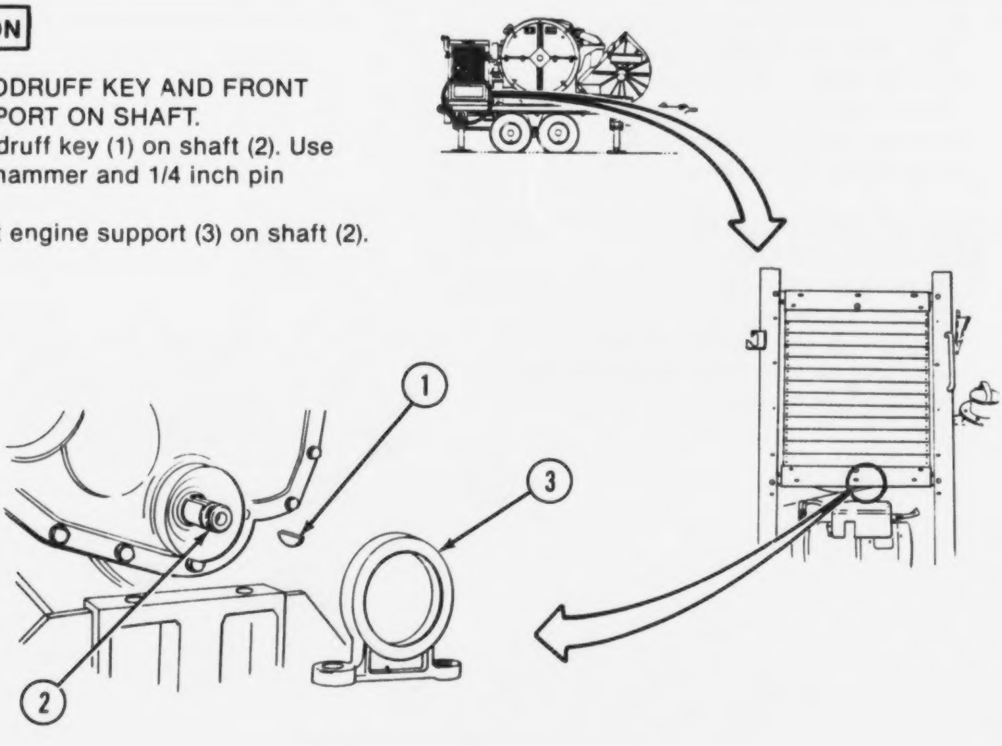
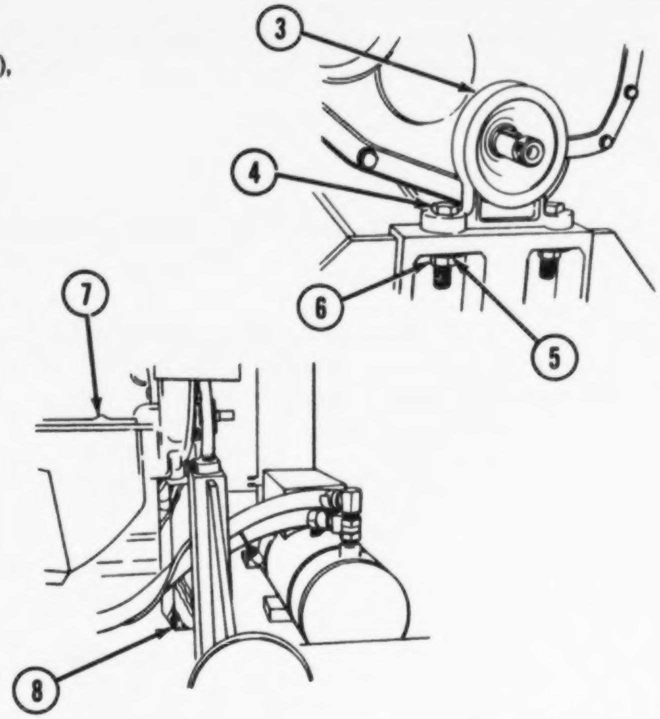
**B. INSTALLATION**

1. INSTALL WOODRUFF KEY AND FRONT ENGINE SUPPORT ON SHAFT.
   - Install woodruff key (1) on shaft (2). Use soft faced hammer and 1/4 inch pin punch.
   - Install front engine support (3) on shaft (2).



2. INSTALL TWO MOUNTING SCREWS ON FRONT ENGINE SUPPORT.
   - Install two mounting screws (4), washers (5), and new self-locking nuts (6) on front engine support (3). Do not tighten.
   - Raise engine (7) just enough to remove wood block (8). Use pry bar.
   - Remove wood block (8) from under engine (7).
   - Tighten two self-locking nuts (6). Use 15/16 inch box end wrench and 15/16 inch open end wrench.



### NOTE

***FOLLOW-ON MAINTENANCE:***

Install Crankshaft Pulley. (See Crankshaft Pulley, Page 15-261.)

Install Engine Front Panel. (See TM 9-1095-205-20.)

Install Fan Belt And Alternator Drive Belt. (See TM 9-1095-205-20.)

Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-20 CRANKSHAFT PULLEY

### DESCRIPTION

This task covers: A. REMOVAL (p 15-261)
B. INSTALLATION (p 15-262)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
  5180-00-177-7033:
    10 inch adjustable wrench
3/4 inch drive 1 5/8 inch socket
  5120-00-199-7765
1 inch drive 1 5/8 inch socket
  5120-00-189-7958
3/4 inch drive 16 inch extension
  5120-00-227-8079
1 inch drive 13 inch extension
  5130-00-449-6659
Soft faced hammer 5120-00-903-8555

***Tools and Special Tools — Continued***

Puller 5120-00-595-9305
3/4 inch drive torque wrench 5120-00-221-7983
1 inch drive electric impact wrench
  5130-00-889-9020
Strap wrench: 1 1/2 inch strap
  7 inch capacity

***Materials/Parts:***

Lock washer (28265)

***References:***

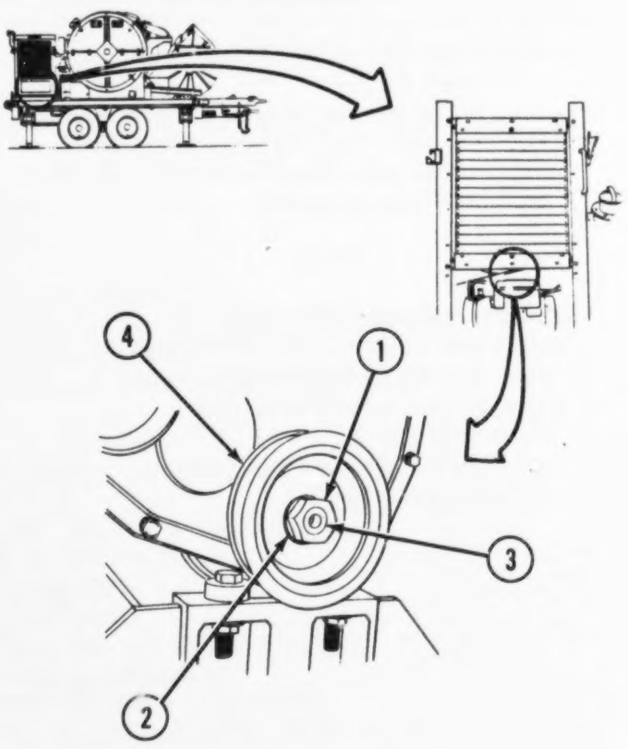
TM 9-1095-205-10
TM 9-1095-205-20

### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Engine Front Panel. (See TM 9-1095-205-20.)
Remove Fan Belt And Alternator Drive Belt. (See TM 9-1095-205-20.)



REMOVE CRANKSHAFT PULLEY FROM CRANKSHAFT.

- Remove nut (1) and lock washer (2) from crankshaft (3). Use 1 5/8 inch socket with 13 inch extension and 1 inch drive impact wrench. Discard lock washer.
- Remove crankshaft pulley (4) from crankshaft (3). Use puller and 10 inch adjustable wrench.

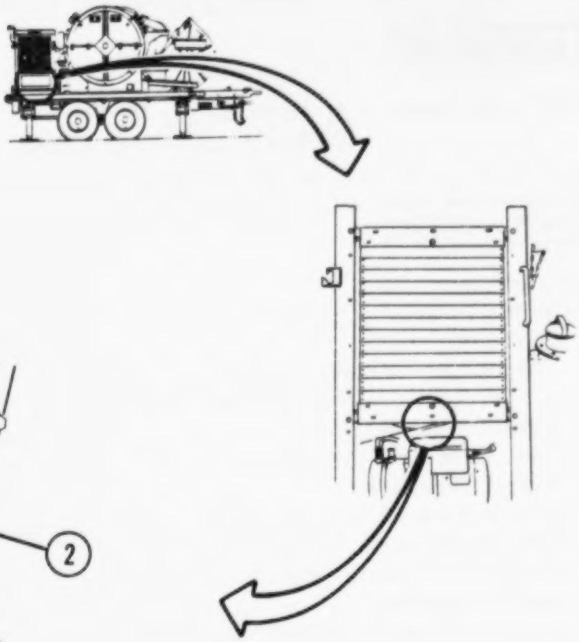
GO TO NEXT PAGE

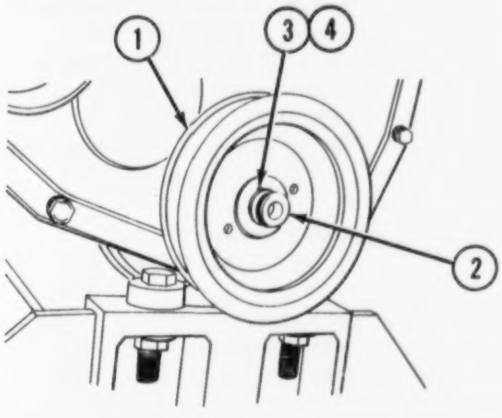
## 15-20 CRANKSHAFT PULLEY — Continued

### B. INSTALLATION

INSTALL CRANKSHAFT PULLEY ON CRANKSHAFT.

- Position crankshaft pulley (1) on crankshaft (2) with pulley slot (3) alined with woodruff key (4) on crankshaft (2).
- Install crankshaft pulley (1) on crankshaft (2). Use soft faced hammer.





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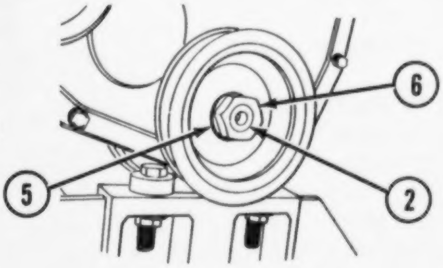
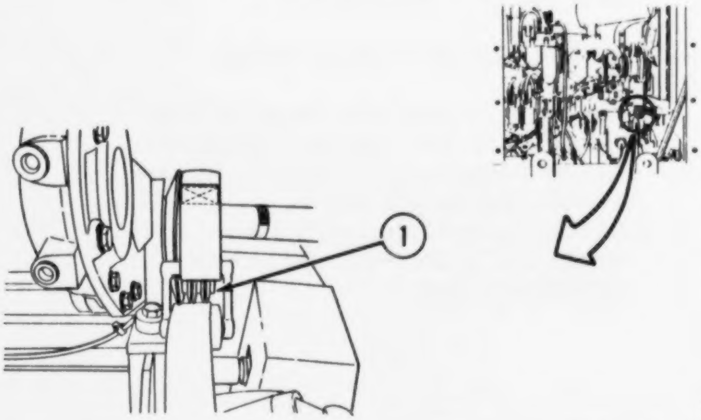
- Install new lock washer (5) and nut (6) on crankshaft (2).
- Hold pulley (1). Use strap wrench. Torque nut (6) to 125 ft lb (17.3 mkg). Use 1 5/8 inch socket with 16 inch extension and 3/4 inch drive torque wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Fan Belt And Alternator Drive Belt. (See TM 9-1095-205-20.)
Install Engine Front Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



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END OF TASK

## 15-21 PUMP DRIVE INSTALLATION

### DESCRIPTION

This task covers:
- A. PUMP DRIVE REMOVAL (p 15-263)
- B. PUMP DRIVE INSTALLATION (p 15-267)
- C. FLYWHEEL DRIVE PLATE ASSEMBLY REMOVAL (p 15-272)
- D. FLYWHEEL DRIVE PLATE ASSEMBLY INSTALLATION (p 15-273)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
 5180-00-177-7033:
  3/8 inch hex key
  9/16 inch socket
  3/4 inch socket
  5 inch extension
  Ratchet handle
Soft faced hammer 5120-00-903-8553
Hoist 3940-00-292-9879
Engine and transmission sling 4910-00-944-4915
Mechanical puller kit 5120-00-313-9496

***Materials/Parts:***

Lock washer (20) 3100-00-637-9541
Lock washer (4) 5310-00-003-4094
Plastic sheet, Item 20, Appendix B
Masking tape, Item 19, Appendix B

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, Page 15-275
LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, Page 15-307
MAGAZINE PUMPS LINKAGE ADJUSTMENT, Page 15-401
RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, Page 15-351
SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, Page 15-409

### A. PUMP DRIVE REMOVAL

**NOTE**

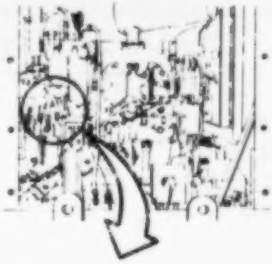
***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

GO TO NEXT PAGE

**A. PUMP DRIVE REMOVAL — Continued**

1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

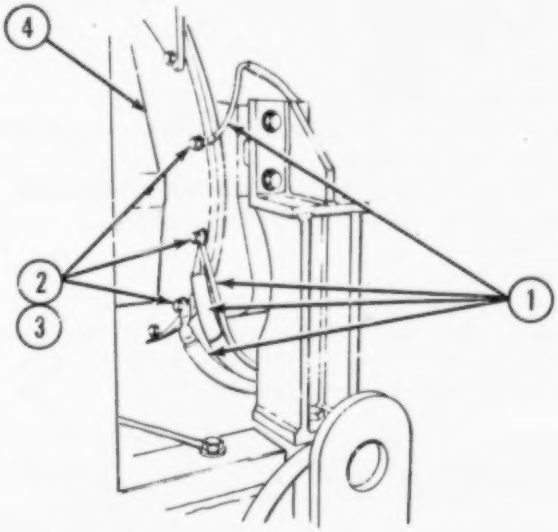


2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

3. REMOVE LAUNCHER PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

4. REMOVE RIGHT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)

5. REMOVE FOUR GROUND LEADS FROM PUMP DRIVE.
   - Tag and mark leads.
   - Remove screws (2), lock washers (3), and ground leads (1) from pump drive (4). Use 9/16 inch socket with ratchet handle. Discard lock washers.



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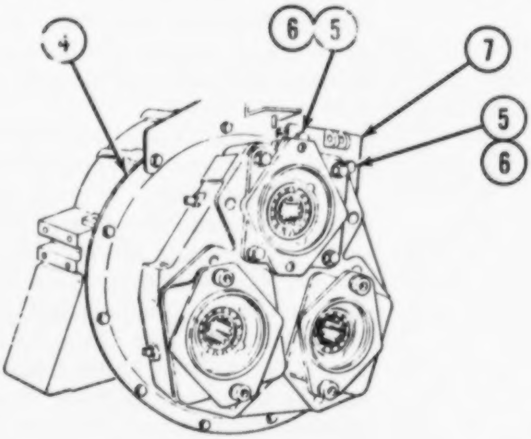
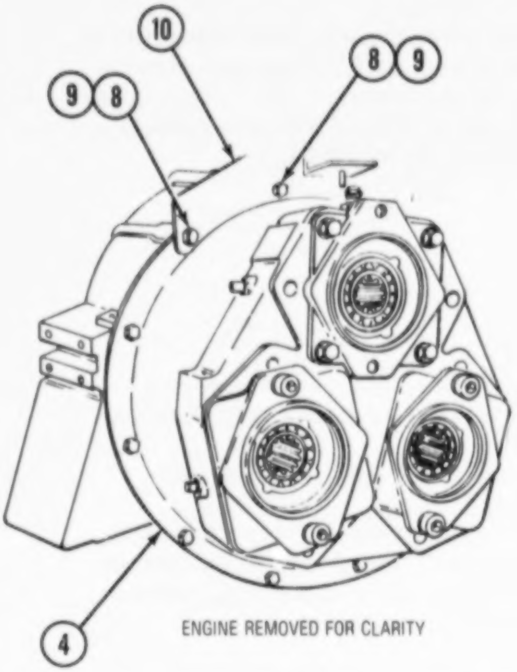
6. REMOVE TURNBUCKLE SUPPORT BRACKET FROM PUMP DRIVE.
   - Remove screws (5), lock washers (6), and support bracket (7) from pump drive (4). Use 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers.



ENGINE REMOVED FOR CLARITY

7. REMOVE HYDRAULIC LINE SUPPORT BRACKET FROM PUMP DRIVE.
   - Remove screws (8), lock washers (9), and support bracket (10) from pump drive (4). Use 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers.



ENGINE REMOVED FOR CLARITY

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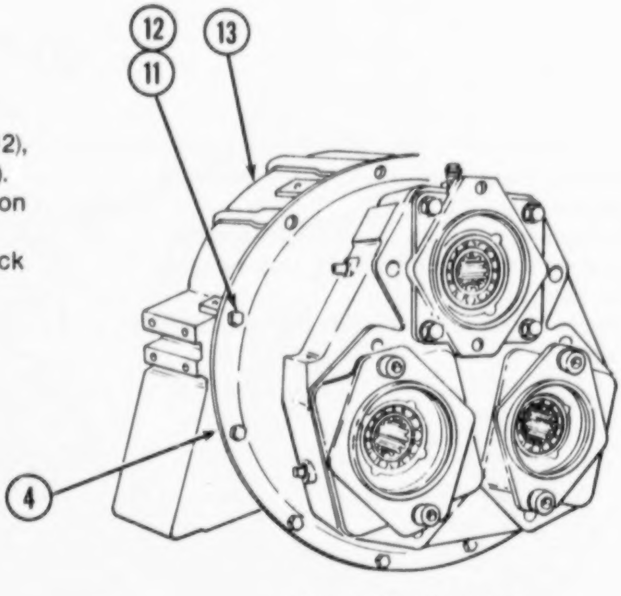
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

8. REMOVE PUMP DRIVE FROM BELL HOUSING.
   - Remove five screws (11), lock washers (12), and pump drive (4) from bell housing (13). Use 9/16 inch socket with 5 inch extension and ratchet handle, engine and transmission sling, and hoist. Discard lock washers. Use helper.



ENGINE REMOVED FOR CLARITY

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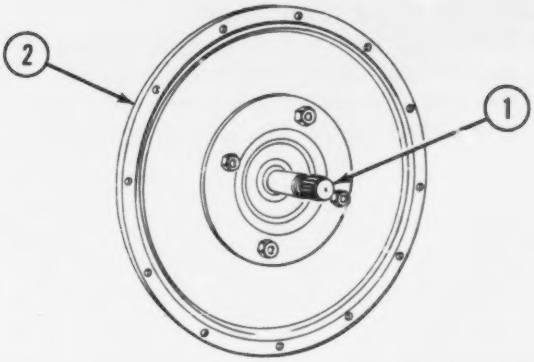
## A. PUMP DRIVE REMOVAL — Continued

9. REMOVE DRIVE SHAFT FROM PUMP DRIVE.
   - Remove drive shaft (1) from rear of pump drive (2). Use helper.
   - Place pump drive (2), rear face down, on wood blocks. Use helper.



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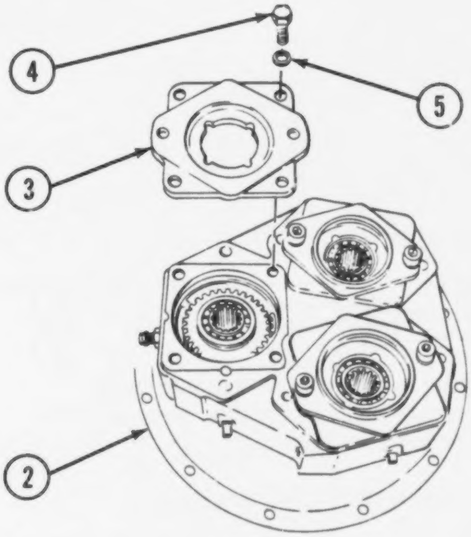
10. REMOVE THREE ADAPTER PLATES FROM PUMP DRIVE.
    - Remove plastic sheet and tape from adapter plate (3).
    - Remove four screws (4), lock washers (5), and adapter plate (3) from pump drive (2). Use 3/4 inch socket with ratchet handle. Discard lock washers.



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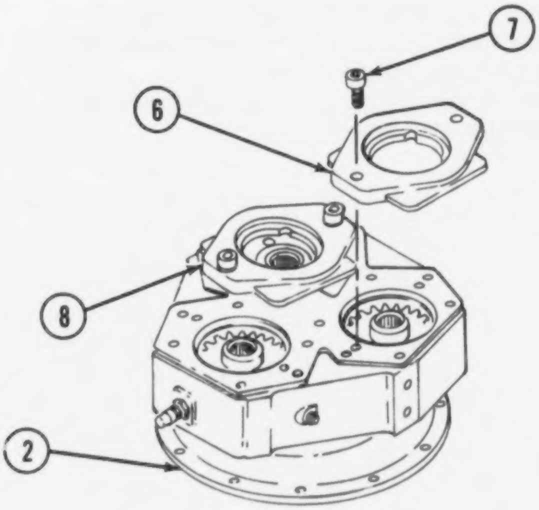
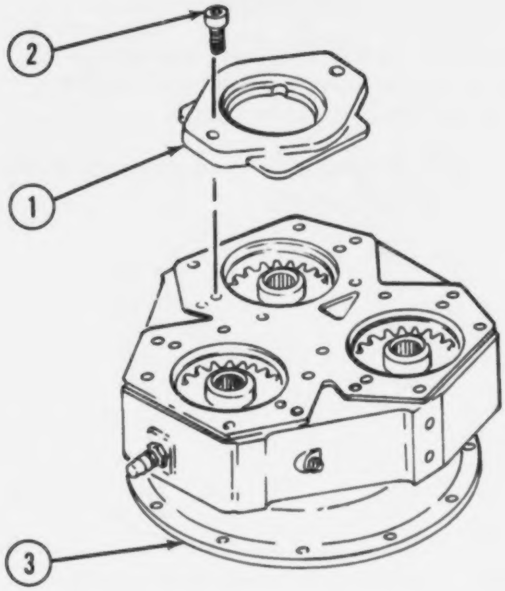
- Remove plastic sheet and tape from right adapter plate (6).
- Remove two screws (7) and right adapter plate (6) from pump drive (2). Use 3/8 inch hex key.
- Repeat above removal steps for left adapter plate (8).



## B. PUMP DRIVE INSTALLATION

1. INSTALL THREE ADAPTER PLATES ON PUMP DRIVE INSTALLATION.
   - Install left adapter plate (1) and two screws (2) on pump drive (3). Use 3/8 inch hex key.
   - Cover adapter plate (1). Use plastic sheet and masking tape.
   - Repeat above installation steps for right adapter plate.



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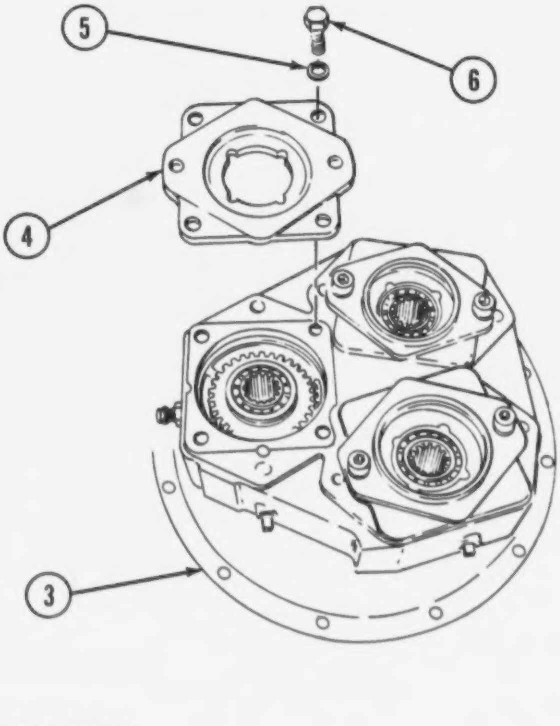
- Install launcher adapter plate (4), four new lock washers (5), and screws (6) on pump drive (3). Use 3/4 inch socket with ratchet handle.
- Cover adapter plate (4). Use plastic sheet and masking tape.



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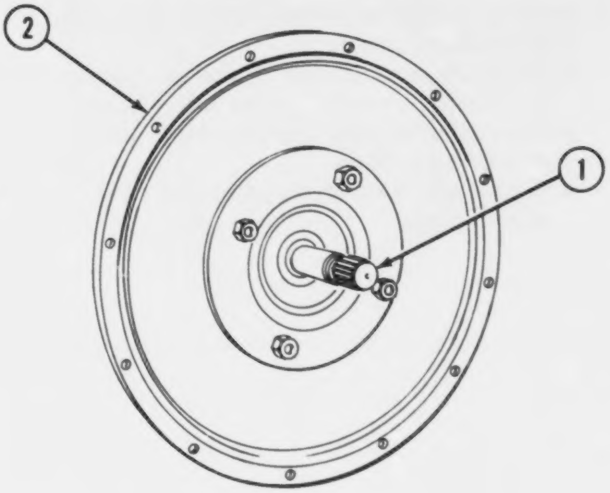
## B. PUMP DRIVE INSTALLATION — Continued

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

2. INSTALL DRIVE SHAFT (1) IN REAR OF PUMP DRIVE (2). USE HELPER.



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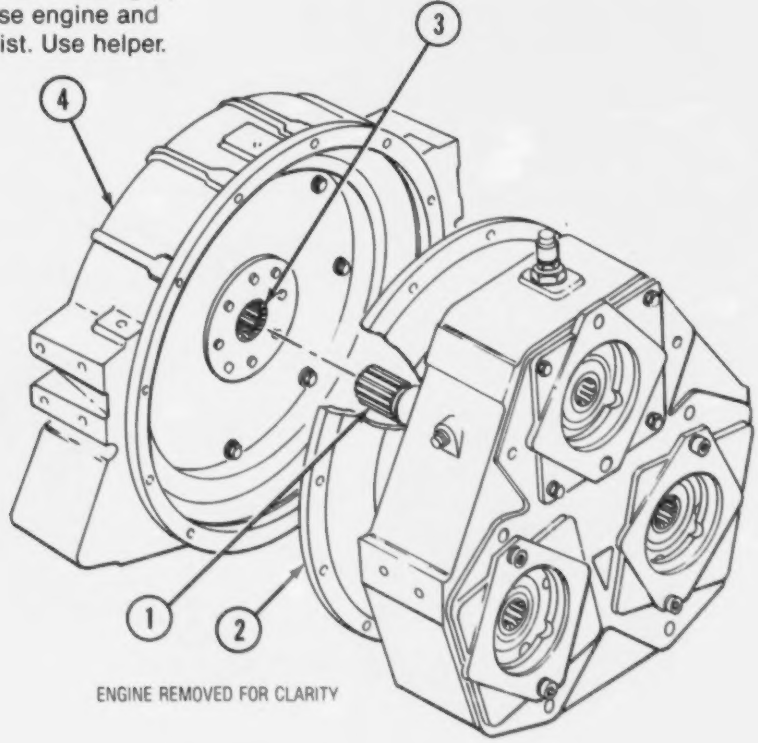
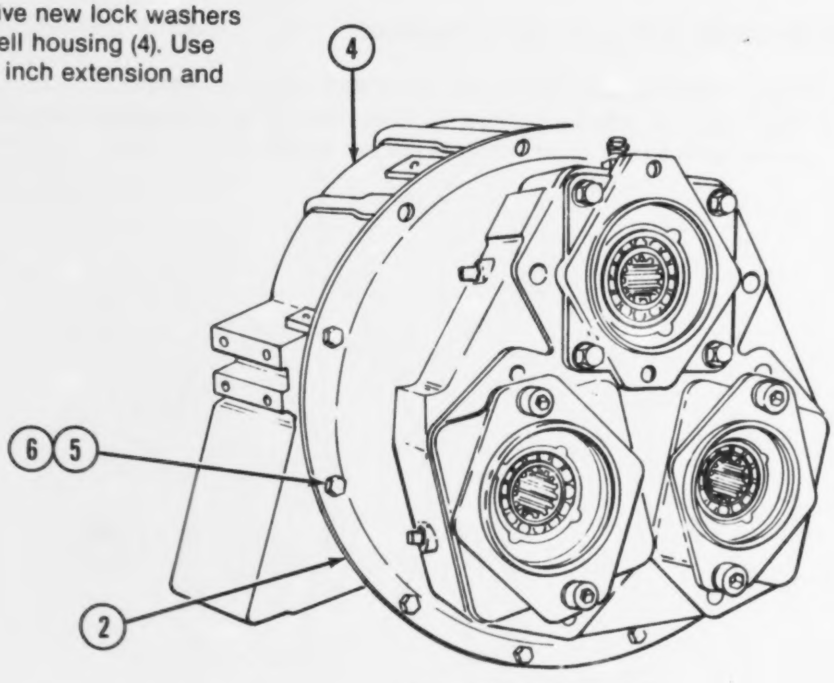
3. INSTALL PUMP DRIVE ON BELL HOUSING.
   - Aline drive shaft (1) with splines in spline collar (3). Use engine and transmission sling, and hoist. Use helper.
   - Position pump drive (2) on bell housing (4), with screw holes alined. Use engine and transmission sling, and hoist. Use helper.



- Install pump drive (2), five new lock washers (5), and screws (6) on bell housing (4). Use 9/16 inch socket with 5 inch extension and ratchet handle.



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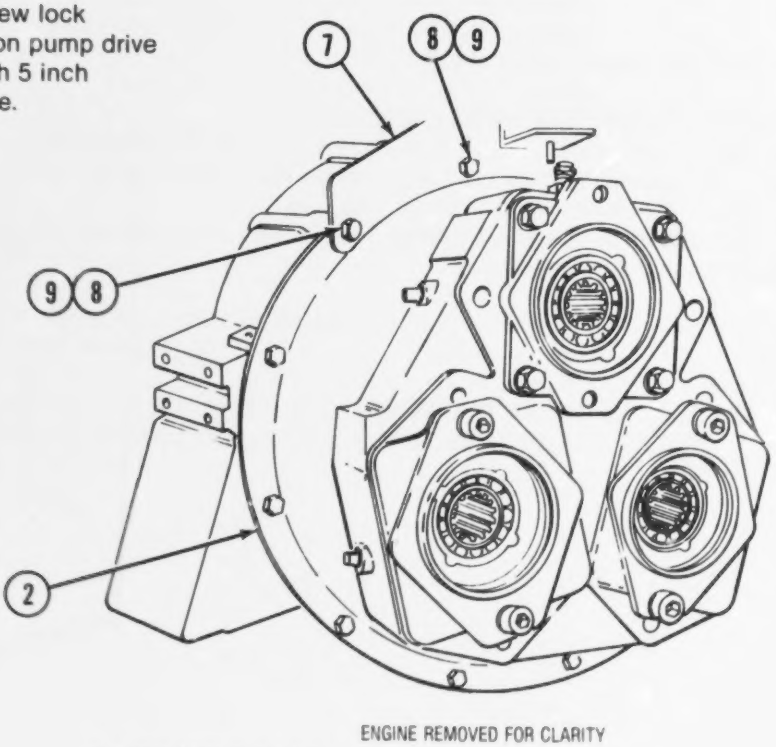
4. INSTALL HYDRAULIC LINE SUPPORT BRACKET ON PUMP DRIVE.
   - Install support bracket (7), new lock washers (8), and screws (9) on pump drive (2). Use 9/16 inch socket with 5 inch extension and ratchet handle.



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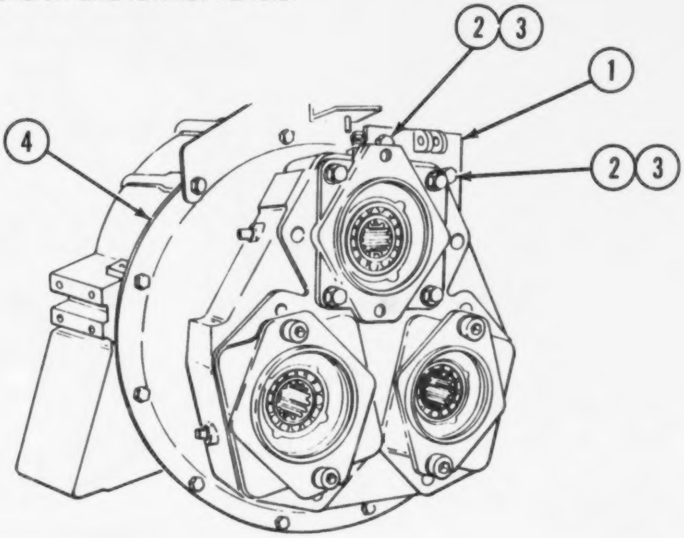
## B. PUMP DRIVE INSTALLATION — Continued

5. INSTALL TURNBUCKLE SUPPORT BRACKET ON PUMP DRIVE.
   - Install support bracket (1), new lock washers (2), and screws (3) on pump drive (4). Use 9/16 inch socket with 5 inch extension and ratchet handle.



ENGINE REMOVED FOR CLARITY

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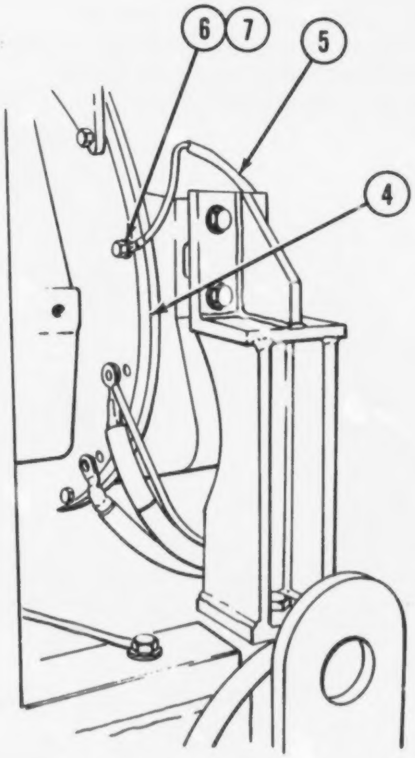
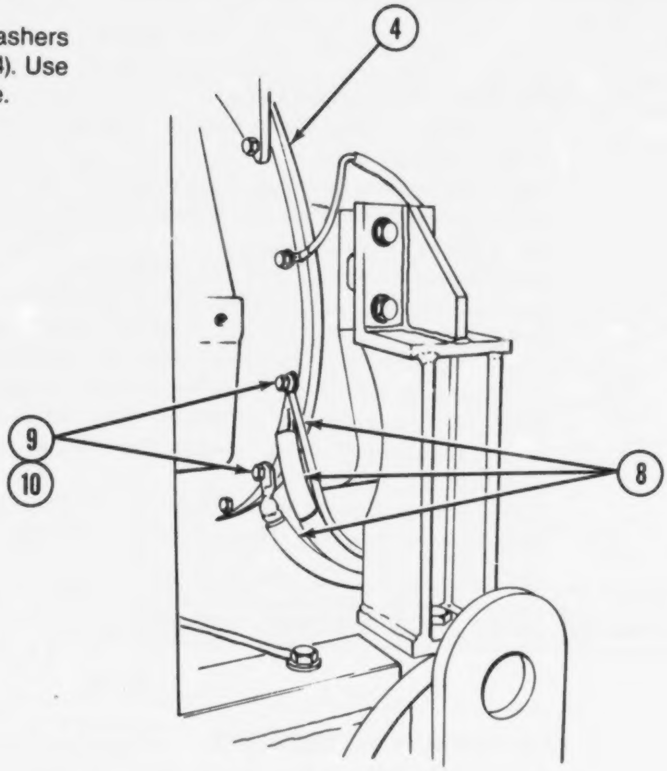
**NOTE**

If installing engine, go to step 7.

6. INSTALL ENGINE GROUND LEAD ON PUMP DRIVE.
   - Install ground lead (5), new lock washer (6), and screw (7) on pump drive (4). Use 9/16 inch socket with ratchet handle.
   - Remove tag from lead.



7. INSTALL THREE GROUND LEADS ON PUMP DRIVE.
   - Install ground leads (8), new lock washers (9), and screws (10) on pump drive (4). Use 9/16 inch socket with ratchet handle.
   - Remove tags from leads.



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8. INSTALL RIGHT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)

9. INSTALL LAUNCHER PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

10. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

11. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

GO TO NEXT PAGE

## B. PUMP DRIVE INSTALLATION — Continued

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

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## C. FLYWHEEL DRIVE PLATE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

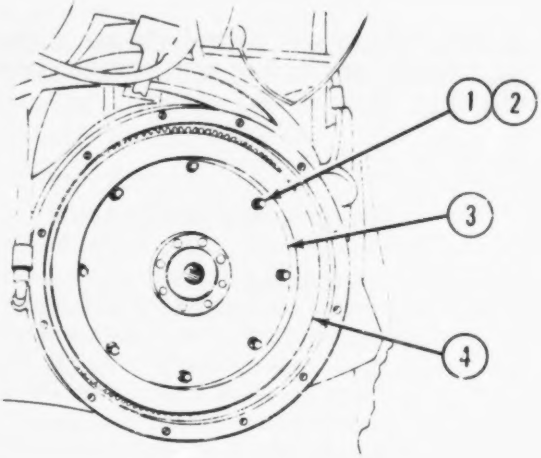
2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

3. REMOVE LAUNCHER PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

4. REMOVE RIGHT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)

5. REMOVE PUMP DRIVE FROM DISPENSER. (SEE PUMP DRIVE INSTALLATION, PAGE 15-263.)

6. REMOVE FLYWHEEL DRIVE PLATE ASSEMBLY FROM FLYWHEEL.
   - Remove eight screws (1) and lock washers (2) from drive plate (3). Use 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers.
   - Remove drive plate (3) from flywheel (4). Use mechanical puller.



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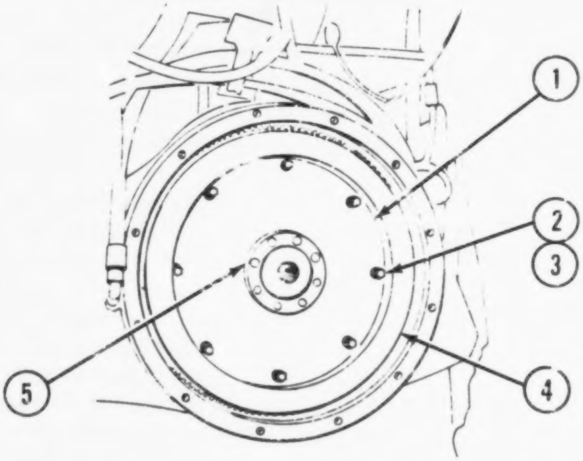
## D. FLYWHEEL DRIVE PLATE ASSEMBLY INSTALLATION

1. INSTALL FLYWHEEL DRIVE PLATE ASSEMBLY ON FLYWHEEL.
   - Install drive plate (1), eight new lock washers (2), and screws (3) on flywheel (4). Do not tighten.
   - Tap spline collar (5) until spline collar is seated. Use soft faced hammer.
   - Tighten eight screws (3). Use 9/16 inch socket and 5 inch extension with ratchet handle.

2. INSTALL PUMP DRIVE ON DISPENSER. (SEE PUMP DRIVE INSTALLATION, PAGE 15-267.)

3. INSTALL RIGHT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)



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## D. FLYWHEEL DRIVE PLATE ASSEMBLY INSTALLATION — Continued

4. INSTALL LAUNCHER PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

5. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

6. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

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END OF TASK

## 15-22 LAUNCHER AND OSCILLATOR PUMPS INSTALLATION

### DESCRIPTION

This task covers:
- A. OSCILLATOR PUMP REMOVAL (p 15-276)
- B. OSCILLATOR PUMP INSTALLATION (p 15-280)
- C. LAUNCHER PUMP REMOVAL (p 15-284)
- D. LAUNCHER PUMP INSTALLATION (p 15-288)
- E. LAUNCHER PUMP FITTINGS REMOVAL (p 15-292)
- F. LAUNCHER PUMP FITTINGS INSTALLATION (p 15-295)
- G. LAUNCHER PUMP LIP SEALS REMOVAL (p 15-298)
- H. LAUNCHER PUMP LIP SEALS INSTALLATION (p 15-300)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
 5180-00-177-7033:
  3/16 inch hex key
  Center punch
  9/16 inch socket
  5 inch extension
  Ratchet handle
  10 inch adjustable wrench
  9/16 inch open end wrench
  7/8 inch open end wrench
  1 inch open end wrench
  1/2 inch box end wrench
  9/16 inch box end wrench
  Ball peen hammer
Cap and plug set 5340-00-450-5718
1 1/4 inch open end wrench 5120-00-277-2322
1 1/2 inch open end wrench 5120-00-277-2325
3/8 inch hex key 5120-00-198-5390
3/16 inch pin punch 5120-00-293-0791
12 inch adjustable wrench 5120-00-264-3796
Engine and transmission sling 4910-00-944-4915
Hoist 3940-00-292-9879
Soft faced hammer 5120-00-903-8555
3/8 inch drive socket set 5120-00-322-6231:
  3/8 inch socket
  10 inch extension
  Universal joint
  Ratchet handle
1/4 inch drive socket set 5120-00-081-2305:
  3/8 inch socket
  2 inch extension
  Universal joint
  Ratchet handle

***Tools and Special Tools — Continued:***

3/8 inch hex key adapter
 Appendix C
Mandrel (2)

***Materials/Parts:***

Preformed packing (2) 5330-00-006-2249
Preformed packing 5330-00-931-6748
Preformed packing 5330-00-251-8839
Preformed packing 5330-00-579-6860
Preformed packing (2) 5330-00-804-5694
Preformed packing 4730-01-091-1368
Lock washer (2) 5310-00-637-9541
Self-locking nut (2) 5310-00-984-3806
Spring pin 5315-00-844-3665
Seal kit 1095-01-155-9568
Plastic sheet, Item 20, Appendix B
Masking tape, Item 19, Appendix B
Crocus cloth, Item 4, Appendix B

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307
MAGAZINE PUMPS LINKAGE ADJUSTMENT, Page 15-401
SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, Page 15-409

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

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## OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

If you remove or disconnect more than one hose assembly, tag and mark each one. Remove tags after installing or connecting hose assemblies.

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## A. OSCILLATOR PUMP REMOVAL

**NOTE**

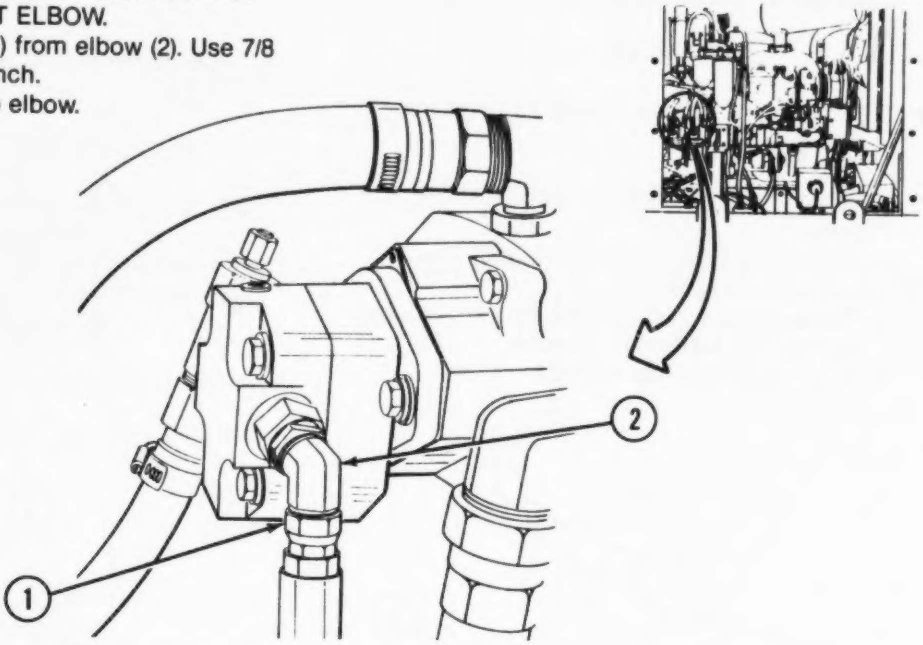
***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

3. DISCONNECT OSCILLATOR PUMP OUTPUT HOSE FROM OUTPUT ELBOW.
   - Disconnect hose (1) from elbow (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap elbow.



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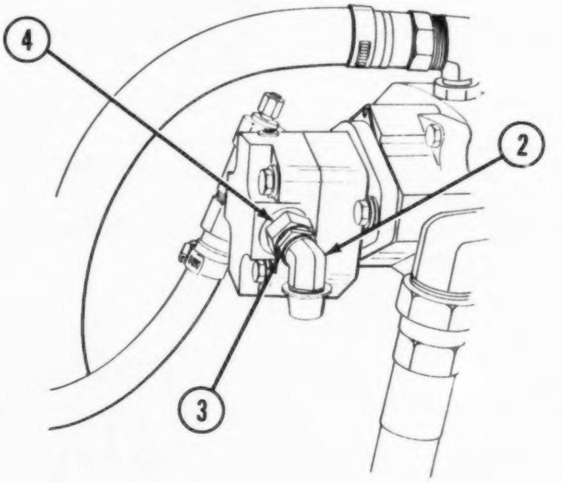
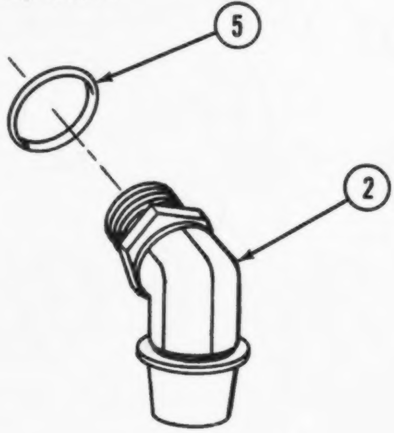
**NOTE**

Do not remove output elbow unless required for maintenance.

4. REMOVE OUTPUT ELBOW FROM REDUCER.
   - Loosen nut (3) on elbow (2). Use 7/8 inch and 1 inch open end wrenches.
   - Remove elbow (2) from reducer (4). Use 7/8 inch open end wrench.
   - Remove preformed packing (5) from elbow (2). Discard preformed packing.
   - Plug reducer, and cap elbow.





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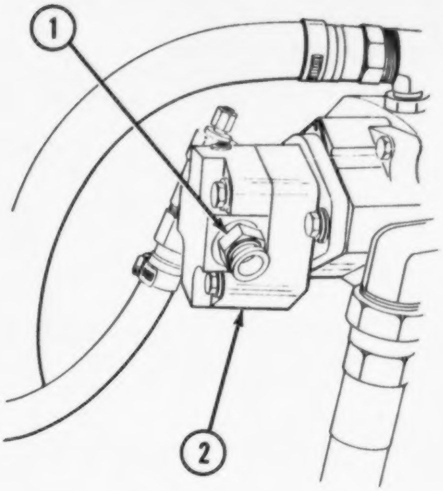
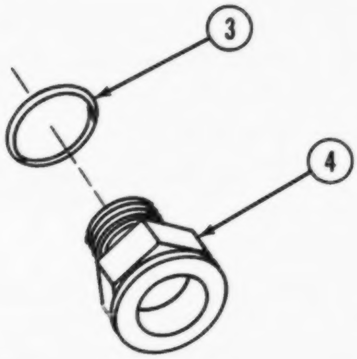
## A. OSCILLATOR PUMP REMOVAL — Continued

**NOTE**

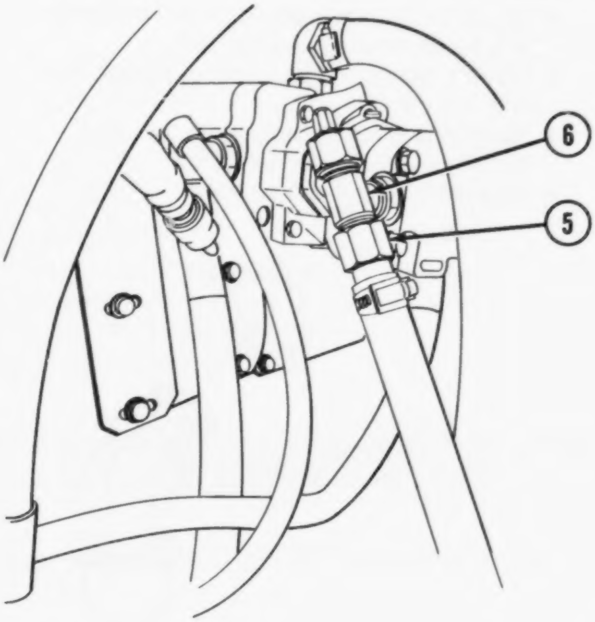
Do not remove reducer unless required for maintenance.

5. REMOVE REDUCER FROM OSCILLATOR PUMP.
   - Remove reducer (1) from pump (2). Use 1 inch open end wrench.
   - Remove preformed packing (3) from reducer (4). Discard preformed packing.
   - Plug pump, and cap reducer.





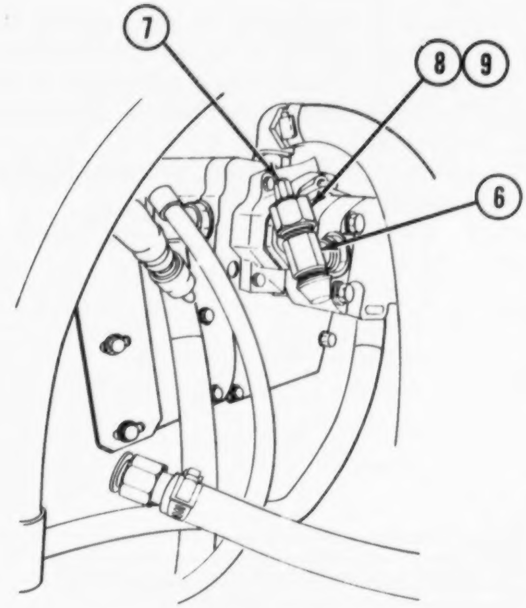
6. DISCONNECT OSCILLATOR PUMP SUCTION HOSE FROM TEE.
   - Disconnect hose (5) from tee (6). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap tee.



## NOTE

Do not remove reducer unless required for maintenance.

7. REMOVE TUBE COUPLING NUT WITH REDUCER FROM TEE.
   - Remove tube cap (7) from reducer (8). Use 9/16 inch open end wrench.
   - Remove tube coupling nut (9) with reducer (8) from tee (6). Use 1 1/4 inch open end wrench.
   - Cap tee.
   - Remove tube coupling nut (9) from reducer (8).
   - Plug and cap reducer.



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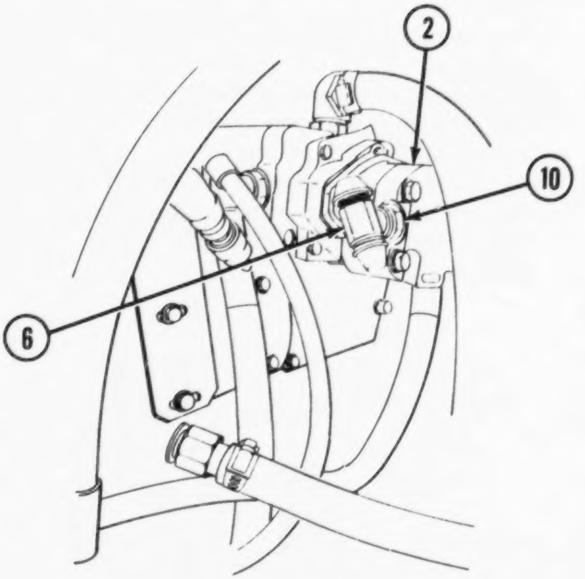
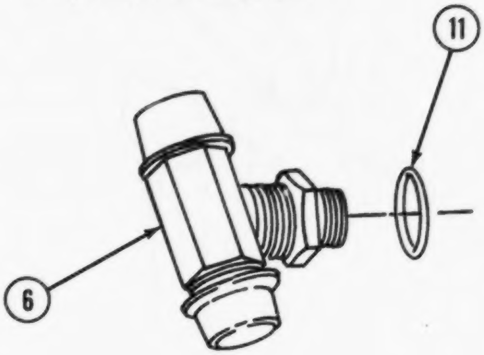
## NOTE

Do not remove tee unless required for maintenance.

8. REMOVE TEE FROM OSCILLATOR PUMP.
   - Loosen nut (10) on tee (6). Use 1 1/4 inch open end wrench.
   - Remove tee (6) from pump (2). Use 10 inch adjustable wrench.
   - Remove preformed packing (11) from tee (6). Discard preformed packing.
   - Plug pump, and cap tee.





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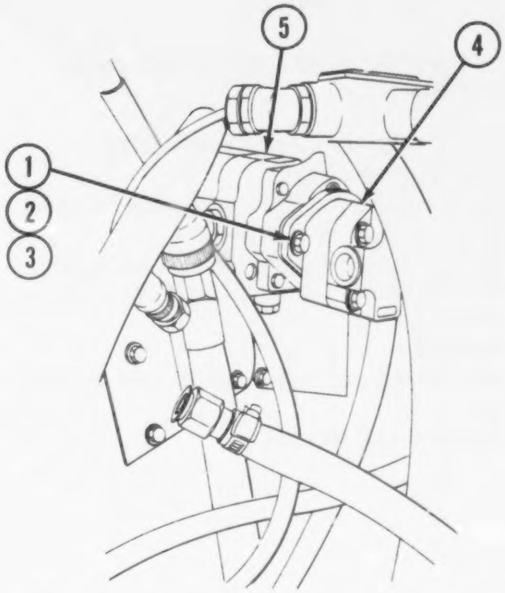
## A. OSCILLATOR PUMP REMOVAL — Continued

9. REMOVE OSCILLATOR PUMP FROM LAUNCHER PUMP.
   - Remove two screws (1), lock washers (2), washers (3), and pump (4) from launcher pump (5). Use 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers.
   - Cover opening in launcher pump (5). Use plastic and tape.



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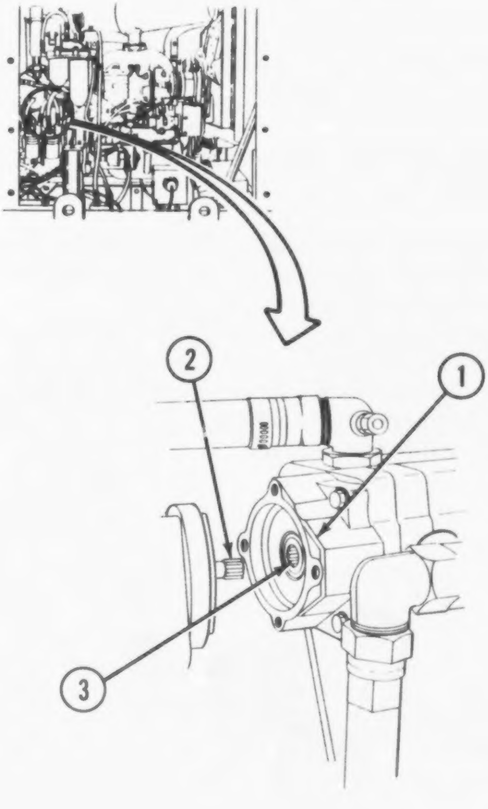
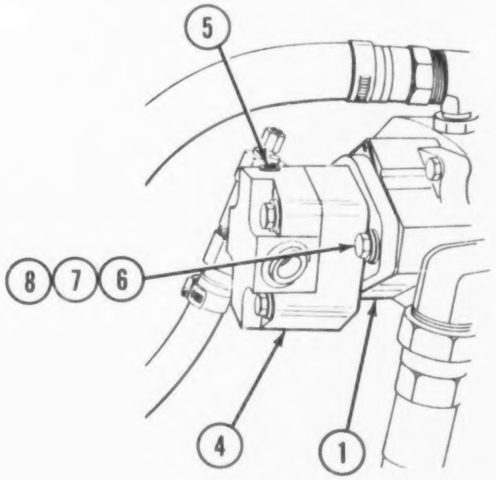
## B. OSCILLATOR PUMP INSTALLATION

1. INSTALL OSCILLATOR PUMP ON LAUNCHER PUMP.
   - Remove plastic and tape from launcher pump (1).
   - Aline oscillator pump shaft (2) with splines in launcher pump spline collar (3).
   - Install oscillator pump (4), with plug (5) up, two washers (6), new lock washers (7), and screws (8) on launcher pump (1). Use 9/16 inch socket with 5 inch extension and ratchet handle.

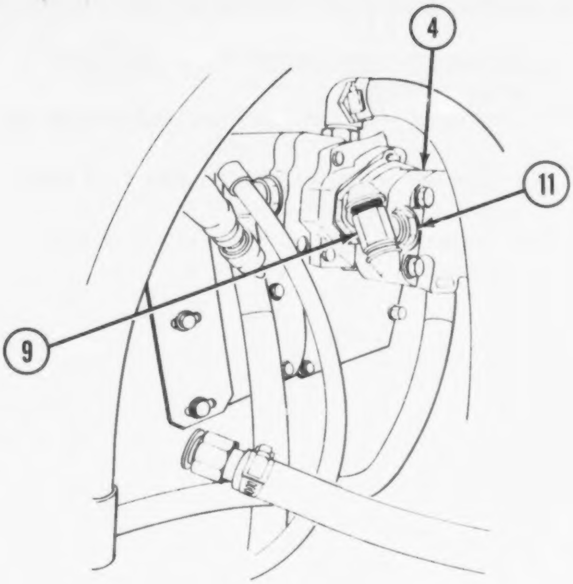


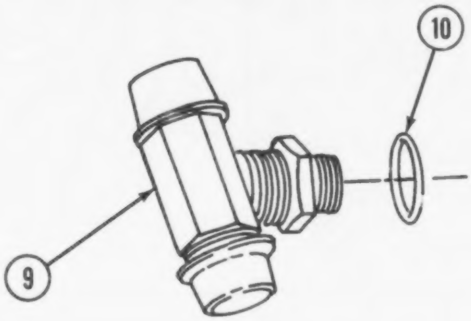


**NOTE**

If tee was not removed, go to step 3.

2. INSTALL TEE ON OSCILLATOR PUMP.
   - Remove plug and cap from pump (4) and tee (9).
   - Apply a light coat of hydraulic fluid to tee (9) and new preformed packing (10).
   - Install preformed packing (10) on tee (9).
   - Install tee (9) on pump (4). Use 10 inch adjustable wrench. Do not tighten nut (11).





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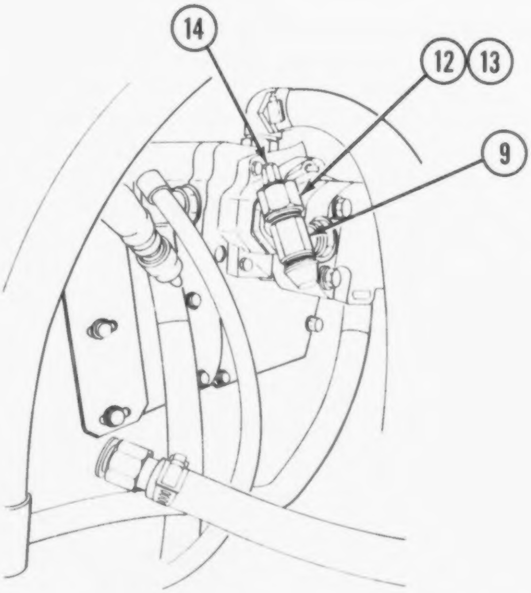
**NOTE**

If reducer was not removed, go to step 4.

3. INSTALL TUBE COUPLING NUT WITH REDUCER ON TEE.
   - Remove plug and cap from reducer (12).
   - Install reducer (12) in tube coupling nut (13).
   - Remove cap from tee (9).
   - Install tube coupling nut (13) with reducer (12) on tee (9). Use 1 1/4 inch open end wrench.
   - Install tube cap (14) on reducer (12). Use 9/16 inch open end wrench.



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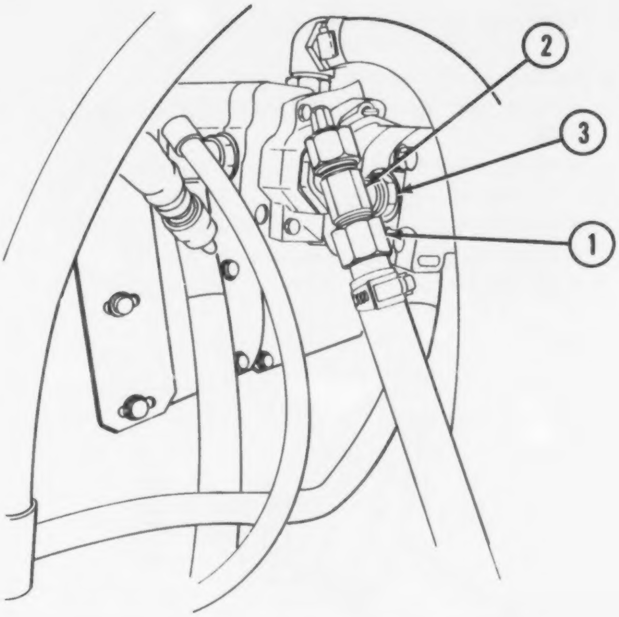
## B. OSCILLATOR PUMP INSTALLATION — Continued

4. CONNECT OSCILLATOR PUMP SUCTION HOSE TO TEE.
   - Remove plug and cap from hose (1) and tee (2).
   - Connect hose (1) to tee (2). Use 1 1/4 inch open end wrench.
   - Tighten nut (3). Use 1 1/4 inch open end wrench.



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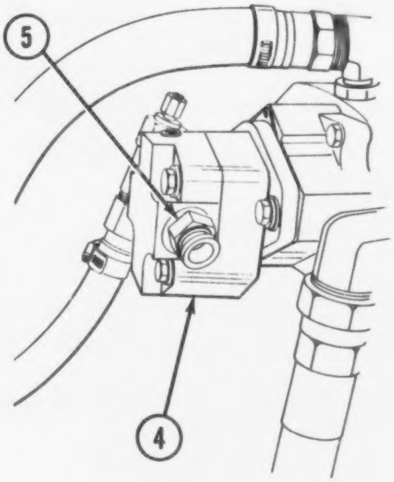
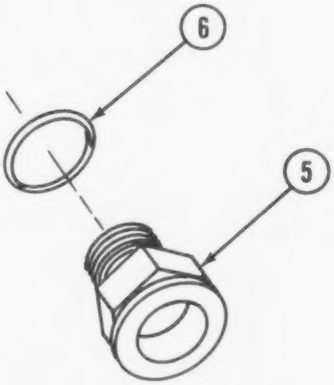
**NOTE**

If reducer was not removed, go to step 6.

5. INSTALL REDUCER ON OSCILLATOR PUMP.
   - Remove plug and cap from pump (4) and reducer (5).
   - Apply light coat of hydraulic fluid to new preformed packing (6) and reducer (5).
   - Install preformed packing (6) on reducer (5).
   - Install reducer (5) on pump (4). Use 1 inch open end wrench.

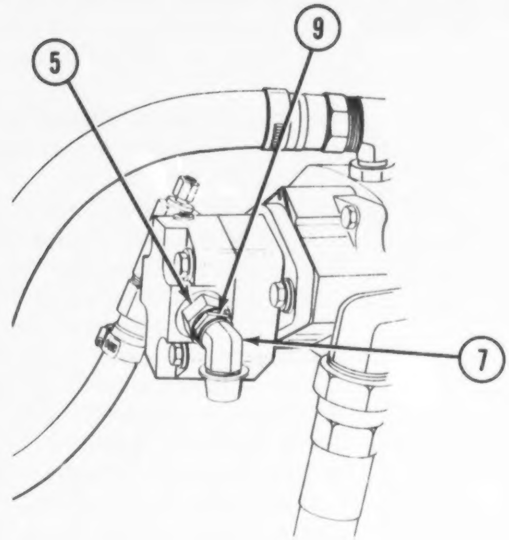


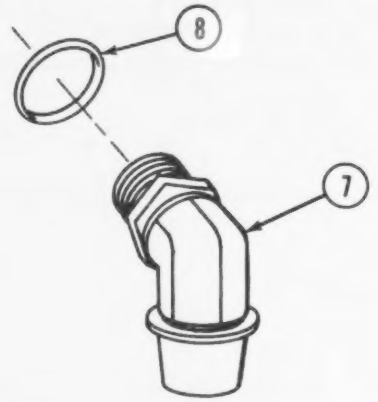


**NOTE**

If output elbow was not removed, go to step 7.

6. INSTALL OUTPUT ELBOW ON OSCILLATOR PUMP.
   - Remove plug and cap from reducer (5) and elbow (7).
   - Apply light coat of hydraulic fluid to new preformed packing (8) and elbow (7).
   - Install preformed packing (8) on elbow (7).
   - Install elbow (7) on reducer (5), and tighten nut (9). Use 7/8 inch open end wrench.

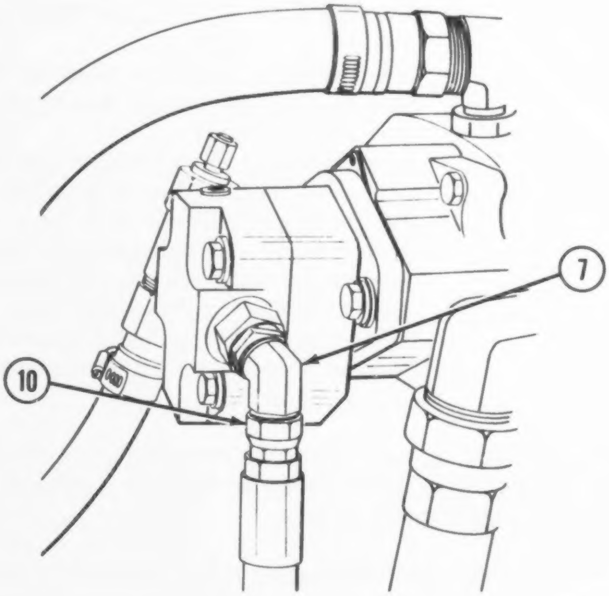




7. CONNECT OSCILLATOR PUMP OUTPUT HOSE TO OUTPUT ELBOW.
   - Remove plug and cap from hose (10) and elbow (7).
   - Connect hose (10) to elbow (7). Use 7/8 inch open end wrench.

8. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

9. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)



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## B. OSCILLATOR PUMP INSTALLATION — Continued

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

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## C. LAUNCHER PUMP REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

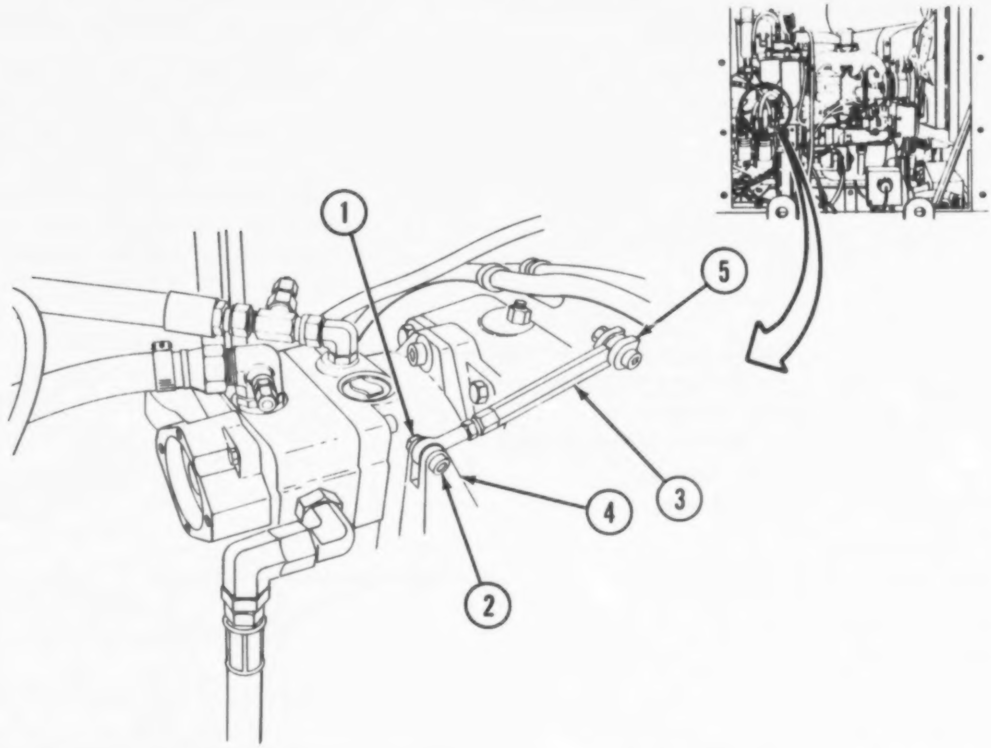
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

3. REMOVE OSCILLATOR PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-276.)

4. REMOVE LAUNCHER PUMP LINKAGE FROM LAUNCHER PUMP.
   - Remove two self-locking nuts (1), screws (2) and linkage (3) from lever (4) and bracket (5). Use 1/2 inch box end wrench and 3/16 inch hex key. Discard self-locking nuts.



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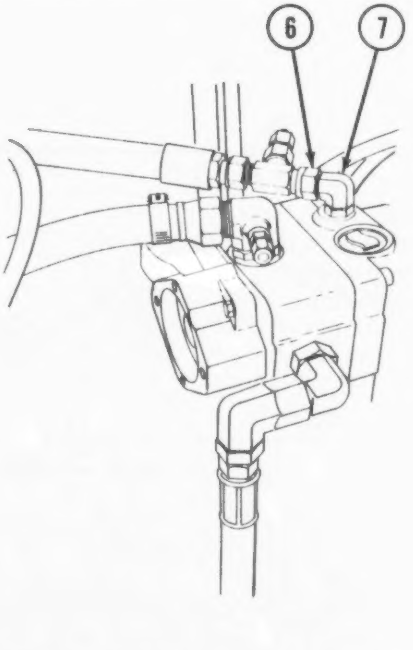
5. DISCONNECT DRAIN HOSE TEE FROM ELBOW.
   - Disconnect tee (6) from elbow (7). Use 1 inch open end wrench.
   - Plug tee, and cap elbow.



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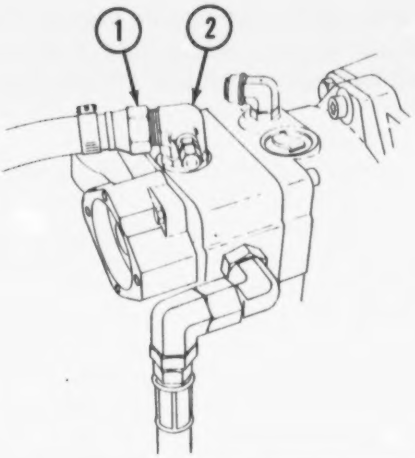
## C. LAUNCHER PUMP REMOVAL — Continued

6. DISCONNECT SUCTION HOSE FROM LAUNCHER PUMP ELBOW.
   - Disconnect hose (1) from elbow (2). Use 1 1/2 inch open end wrench.
   - Plug hose, and cap elbow.



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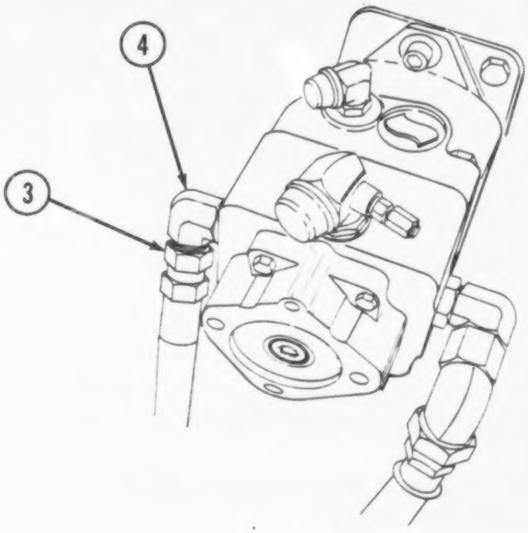
7. DISCONNECT OUTLET HOSE FROM LAUNCHER PUMP ELBOW.
   - Disconnect hose (3) from elbow (4). Use 1 1/2 inch open end wrench.
   - Plug hose, and cap elbow.



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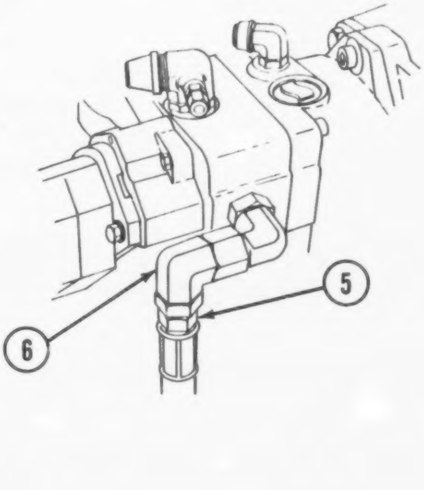
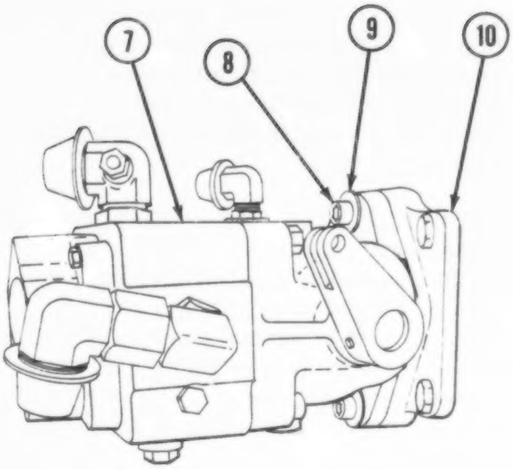
8. DISCONNECT RETURN HOSE FROM LAUNCHER PUMP ELBOW.
   - Disconnect hose (5) from elbow (6). Use 1 1/2 inch open end wrench.
   - Plug hose, and cap elbow.



**NOTE**

If launcher pump is to be replaced, remove launcher pump fittings (see Launcher and Oscillator Pumps Installation, Page 15-292) after launcher pump is removed.

9. REMOVE LAUNCHER PUMP FROM PUMP DRIVE ASSEMBLY.
   - Support pump (7). Use engine and transmission sling, and hoist.
   - Remove two screws (8) and washers (9) from pump (7). Use 3/8 inch hex key adapter and 3/8 inch socket with universal joint, 10 inch extension, and 3/8 inch drive ratchet handle.
   - Remove pump (7) from adapter plate (10). Use engine and transmission sling, and hoist. Use helper.



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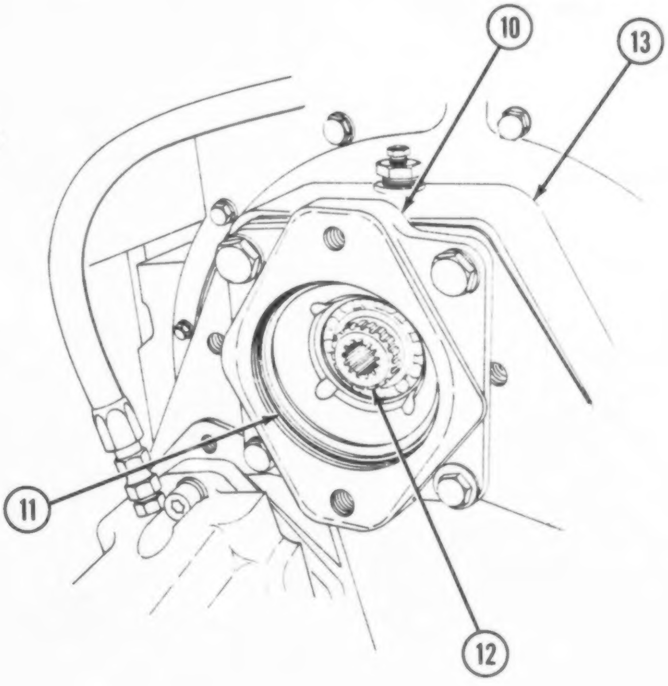
- Remove preformed packing (11) from adapter plate (10). Discard preformed packing.
- Remove splined adapter (12) from pump drive (13).
- Cover adapter plate (10). Use plastic sheet and masking tape.



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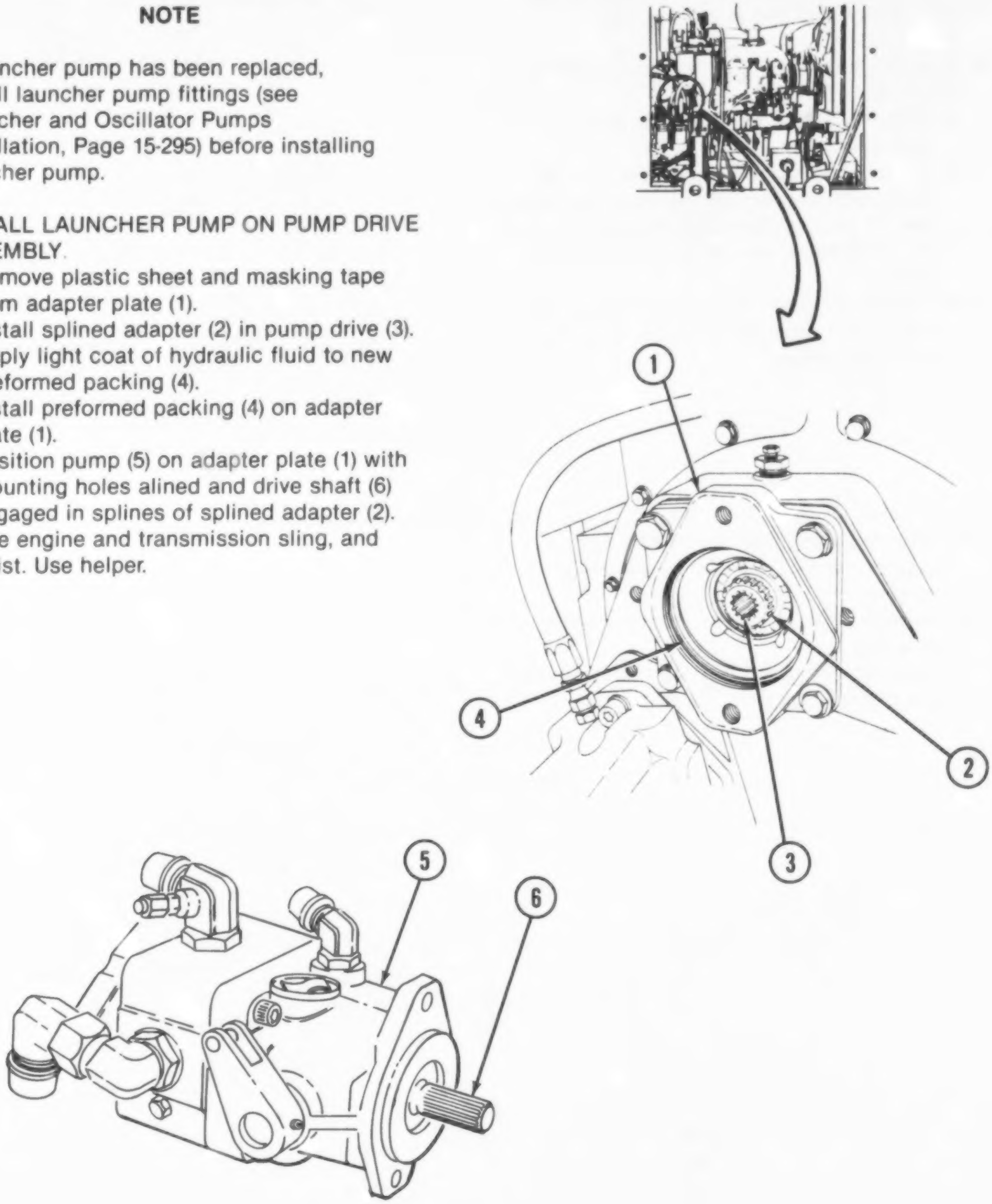
## 15-22 LAUNCHER AND OSCILLATOR PUMPS INSTALLATION — Continued

### D. LAUNCHER PUMP INSTALLATION

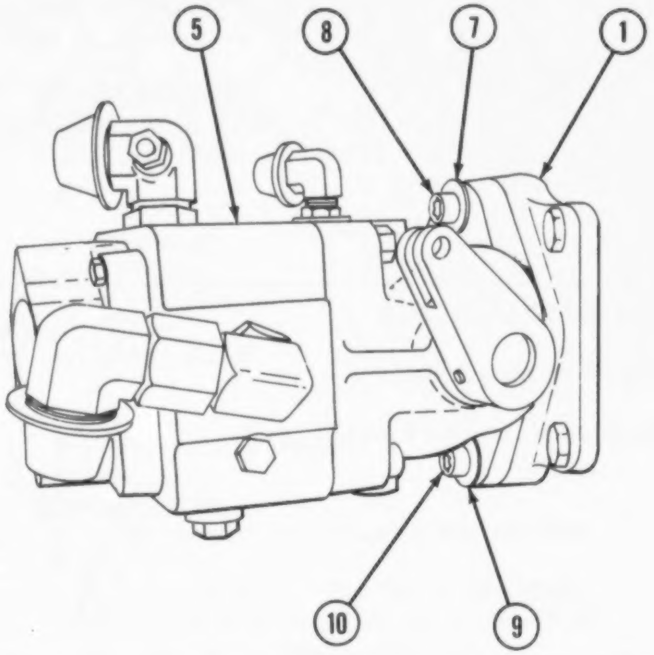
**NOTE**

If launcher pump has been replaced, install launcher pump fittings (see Launcher and Oscillator Pumps Installation, Page 15-295) before installing launcher pump.

1. INSTALL LAUNCHER PUMP ON PUMP DRIVE ASSEMBLY.
   - Remove plastic sheet and masking tape from adapter plate (1).
   - Install splined adapter (2) in pump drive (3).
   - Apply light coat of hydraulic fluid to new preformed packing (4).
   - Install preformed packing (4) on adapter plate (1).
   - Position pump (5) on adapter plate (1) with mounting holes alined and drive shaft (6) engaged in splines of splined adapter (2). Use engine and transmission sling, and hoist. Use helper.



- Install pump (5), washer (7), and screw (8) on adapter plate (1). Use 3/8 inch hex key. Do not tighten.
- Install washer (9) and screw (10) on pump (5) and adapter plate (1). Use 3/8 inch hex key adapter and 3/8 inch socket with 2 inch extension, universal joint, and 1/4 inch drive ratchet handle. Do not tighten.
- Tighten screw (8) and screw (10) evenly. Use 3/8 inch hex key and 3/8 inch hex key adapter with 3/8 inch socket, 2 inch extension, universal joint, and 1/4 inch drive ratchet handle.
- Remove sling from pump (5).



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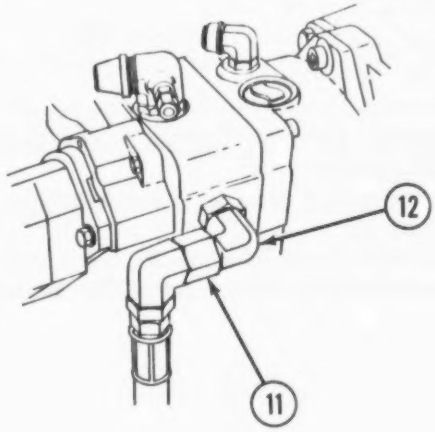
2. CONNECT RETURN HOSE TO LAUNCHER PUMP ELBOW.
   - Remove plug and cap from hose (11) and elbow (12).
   - Connect hose (11) to elbow (12). Use 1 1/2 inch open end wrench.



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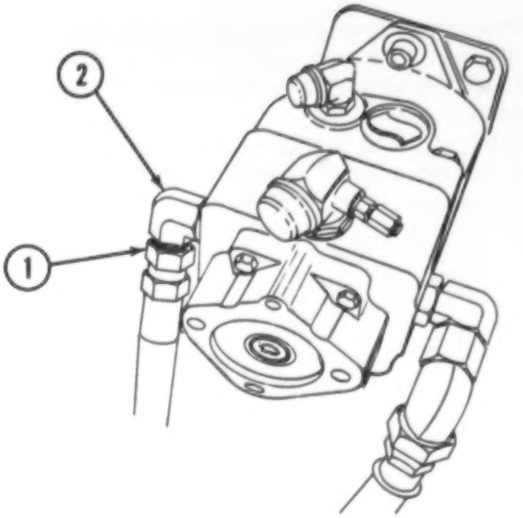
## D. LAUNCHER PUMP INSTALLATION — Continued

3. CONNECT OUTLET HOSE TO LAUNCHER PUMP ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 1 1/2 inch open end wrench.



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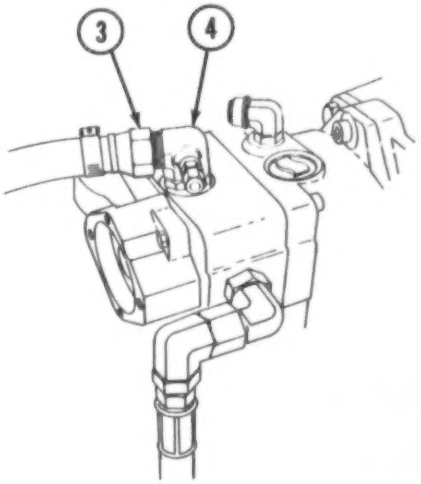
4. CONNECT SUCTION HOSE TO LAUNCHER PUMP ELBOW.
   - Remove plug and cap from hose (3) and elbow (4).
   - Connect hose (3) to elbow (4). Use 1 1/2 inch open end wrench.



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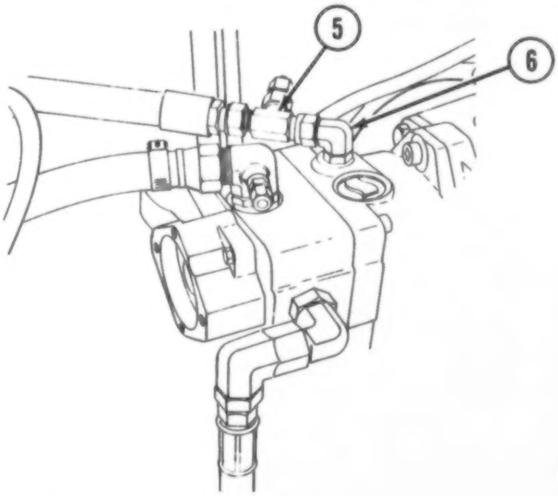
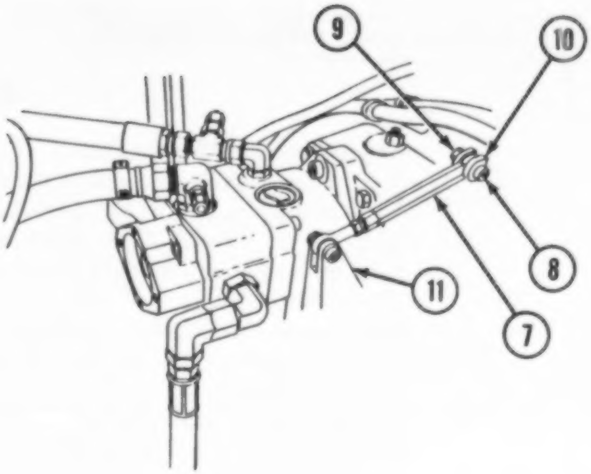
5. CONNECT DRAIN HOSE TEE TO LAUNCHER PUMP ELBOW.
   - Remove plug and cap from tee (5) and elbow (6).
   - Connect tee (5) to elbow (6). Use 1 inch open end and 10 inch adjustable wrenches.



6. INSTALL LAUNCHER PUMP LINKAGE ON LAUNCHER PUMP.
   - Install linkage (7), two screws (8), and new self-locking nuts (9) on bracket (10) and lever (11). Use 1/2 inch box end wrench and 3/16 inch hex key.



7. INSTALL OSCILLATOR PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-280.)

8. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

9. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

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## 15-22 LAUNCHER AND OSCILLATOR PUMPS INSTALLATION — Continued

### E. LAUNCHER PUMP FITTINGS REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

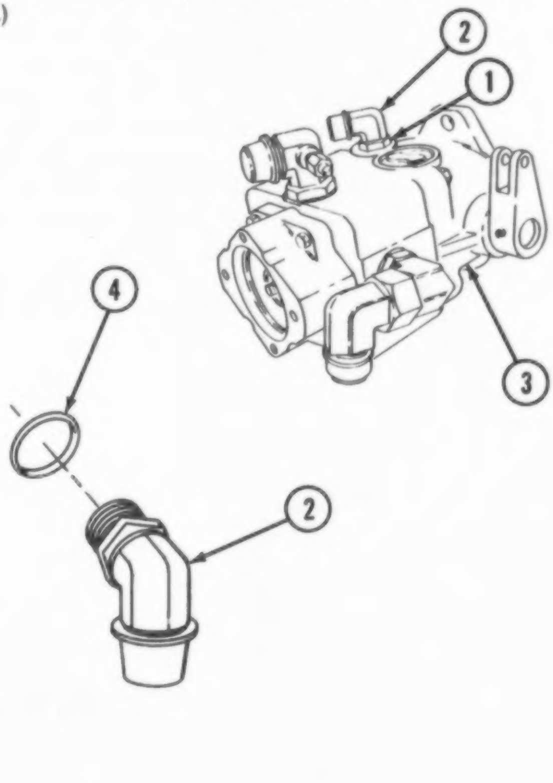
1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

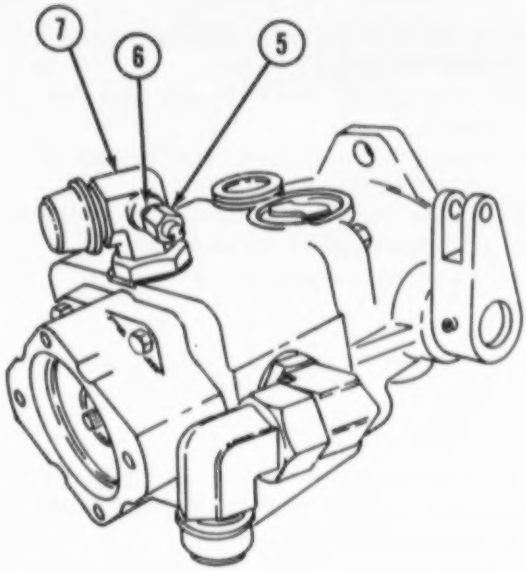
3. REMOVE OSCILLATOR PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-276.)

4. REMOVE LAUNCHER PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-284.)

5. REMOVE DRAIN HOSE ELBOW FROM LAUNCHER PUMP.
   - Loosen nut (1). Use 1 inch open end wrench.
   - Remove elbow (2) from pump (3). Use 10 inch adjustable wrench.
   - Remove preformed packing (4) from elbow (2). Discard preformed packing.
   - Plug pump, and cap elbow.



6. REMOVE SUCTION HOSE ELBOW FROM LAUNCHER PUMP.
   - Remove tube cap (5) from adapter (6). Use 9/16 inch box end wrench.
   - Cap adapter.
   - Remove adapter (6) from elbow (7). Use 9/16 inch box end wrench.
   - Plug elbow, and cap adapter.



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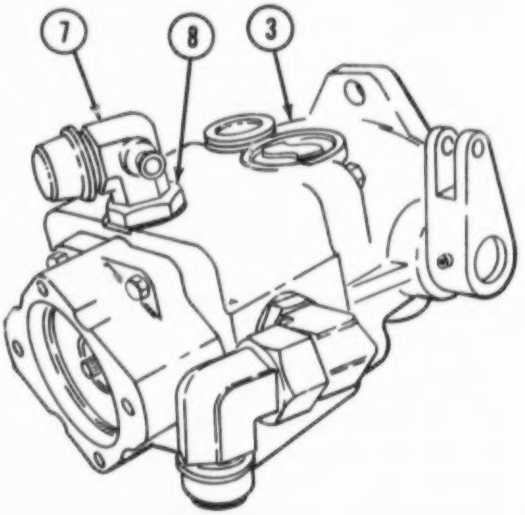
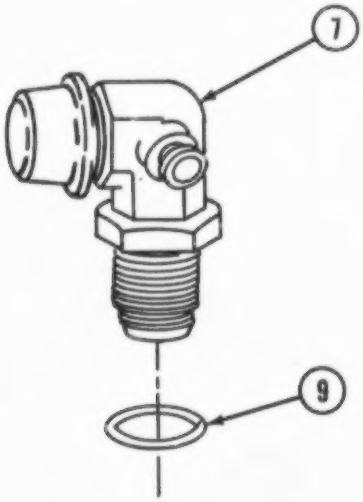
- Loosen nut (8). Use 1 1/2 inch open end wrench.
- Remove elbow (7) from pump (3). Use 12 inch adjustable wrench.
- Remove preformed packing (9) from elbow (7). Discard preformed packing.
- Plug pump, and cap elbow.





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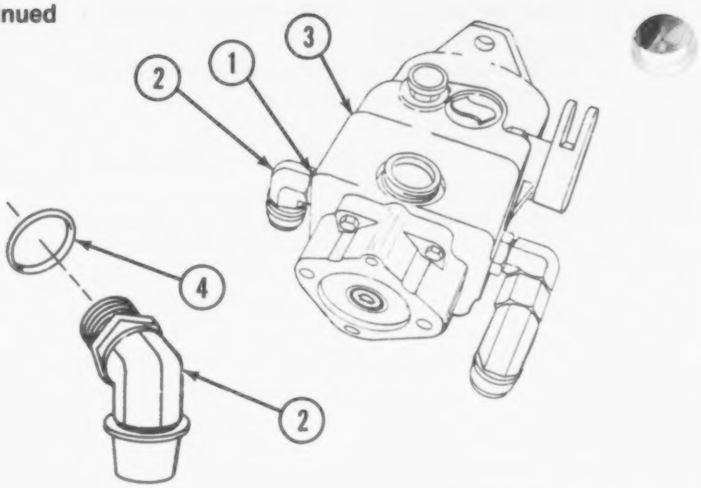
## E. LAUNCHER PUMP FITTINGS REMOVAL — Continued

7. REMOVE OUTLET HOSE ELBOW FROM LAUNCHER PUMP.
   - Loosen nut (1). Use 1 1/2 inch open end wrench.
   - Remove elbow (2) from pump (3). Use 12 inch adjustable wrench.
   - Remove preformed packing (4) from elbow (2). Discard preformed packing.
   - Plug pump, and cap elbow.



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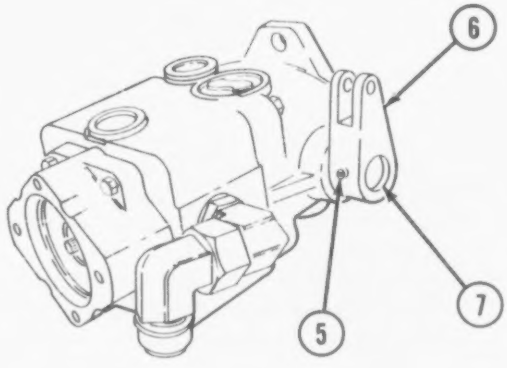
8. REMOVE LEVER FROM LAUNCHER PUMP TRUNNION SHAFT.
   - Remove spring pin (5) from lever (6). Use 3/16 inch pin punch and ball peen hammer. Discard spring pin.
   - Tap lever (6) from shaft (7). Use soft faced hammer.



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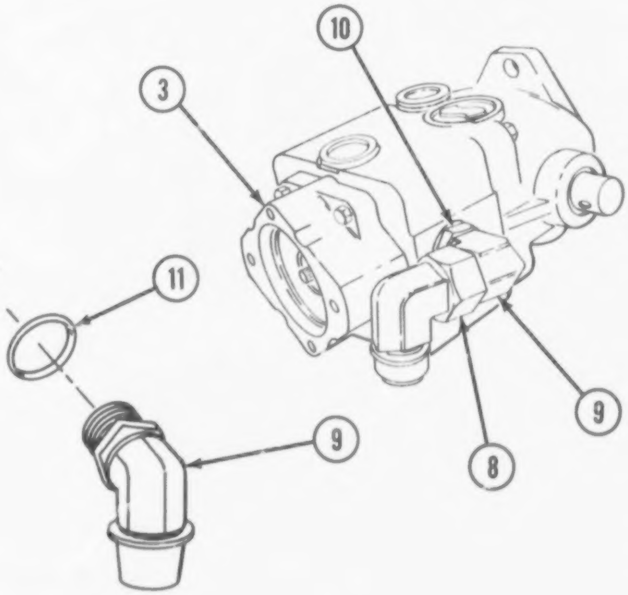
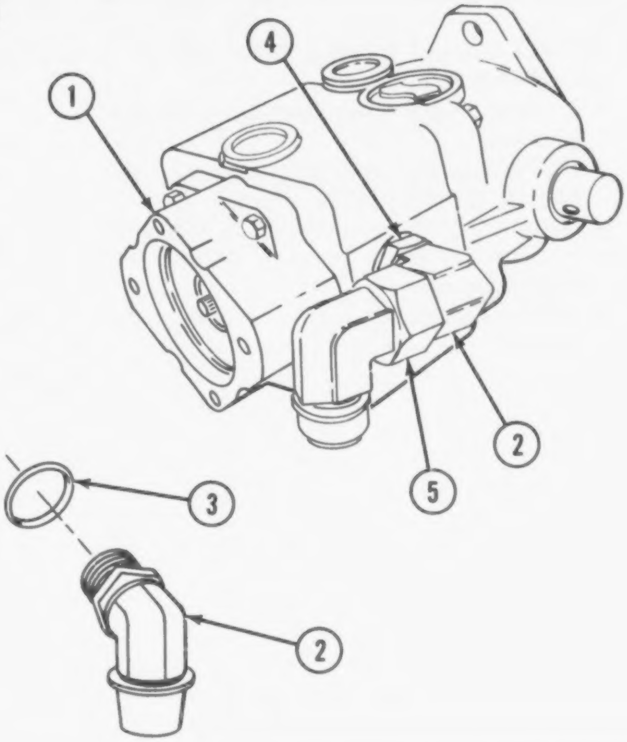
9. REMOVE TWO RETURN HOSE ELBOWS FROM LAUNCHER PUMP.
   - Remove elbow (8) from elbow (9). Use 12 inch adjustable wrench.
   - Plug and cap elbows.
   - Loosen nut (10). Use 1 1/2 inch open end wrench.
   - Remove elbow (9) from pump (3). Use 12 inch adjustable wrench.
   - Remove preformed packing (11) from elbow (9). Discard preformed packing.
   - Plug pump, and cap elbow.



## F. LAUNCHER PUMP FITTINGS INSTALLATION

1. INSTALL TWO RETURN HOSE ELBOWS ON LAUNCHER PUMP.
   - Remove plug and cap from pump (1) and elbow (2).
   - Lightly coat elbow (2) and new preformed packing (3) with hydraulic fluid.
   - Install preformed packing (3) on elbow (2).
   - Install elbow (2) on pump (1). Use 12 inch adjustable wrench.
   - Tighten nut (4). Use 1 1/2 inch open end wrench.
   - Remove plug and cap from elbow (5) and elbow (2).
   - Install elbow (5) on elbow (2). Use 12 inch adjustable wrench.



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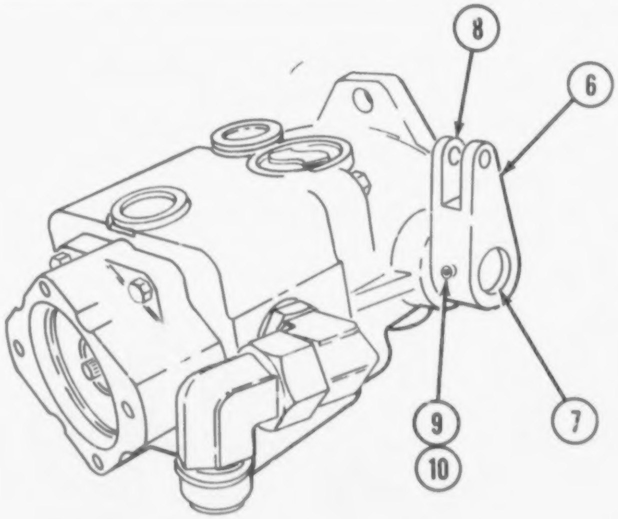
2. INSTALL LEVER ON LAUNCHER PUMP TRUNNION SHAFT.
   - Position lever (6) on shaft (7) with clevis (8) pointing up and spring pin mounting holes (9) alined.
   - Install new spring pin (10) on lever (6) and shaft (7). Use ball peen hammer.



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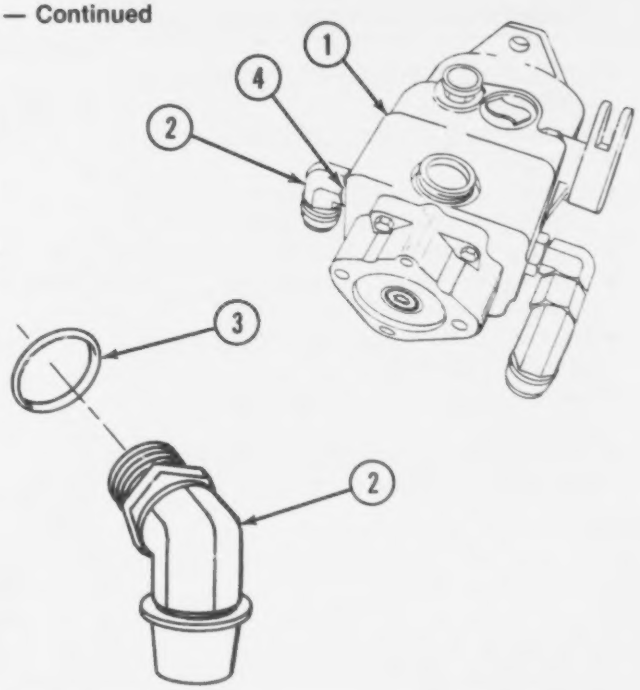
## F. LAUNCHER PUMP FITTINGS INSTALLATION — Continued

3. INSTALL OUTLET HOSE ELBOW ON LAUNCHER PUMP.
   - Remove plug and cap from pump (1) and elbow (2).
   - Lightly coat elbow (2) and new preformed packing (3) with hydraulic fluid.
   - Install preformed packing (3) on elbow (2).
   - Install elbow (2) on pump (1). Use 12 inch adjustable wrench.
   - Tighten nut (4). Use 1 1/2 inch open end wrench.



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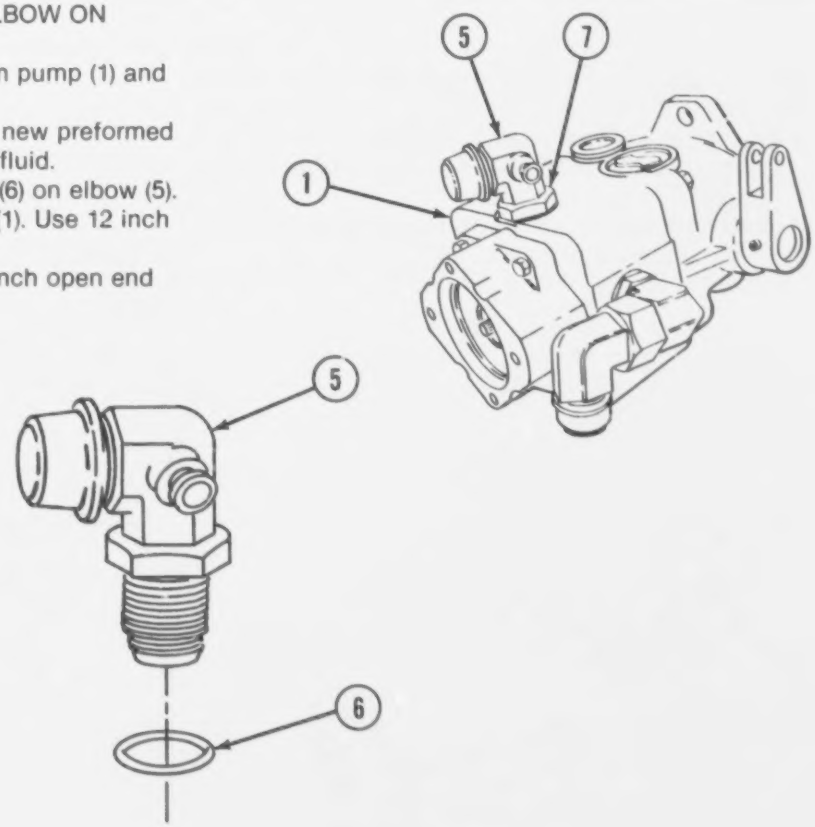
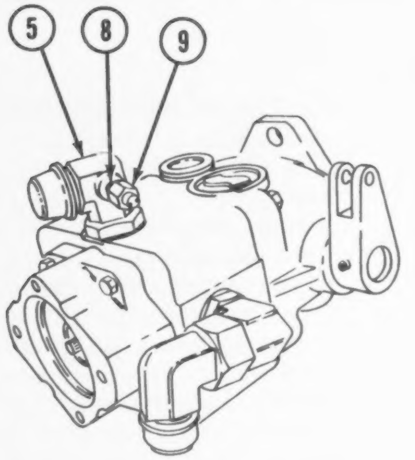
4. INSTALL SUCTION HOSE ELBOW ON LAUNCHER PUMP.
   - Remove plug and cap from pump (1) and elbow (5).
   - Lightly coat elbow (5) and new preformed packing (6) with hydraulic fluid.
   - Install preformed packing (6) on elbow (5).
   - Install elbow (5) on pump (1). Use 12 inch adjustable wrench.
   - Tighten nut (7). Use 1 1/2 inch open end wrench.



- Remove plug and cap from elbow (5) and adapter (8).
- Install adapter (8) on elbow (5). Use 9/16 inch box end wrench.
- Remove cap from adapter (8).
- Install tube cap (9) on adapter (8). Use 9/16 inch box end wrench.



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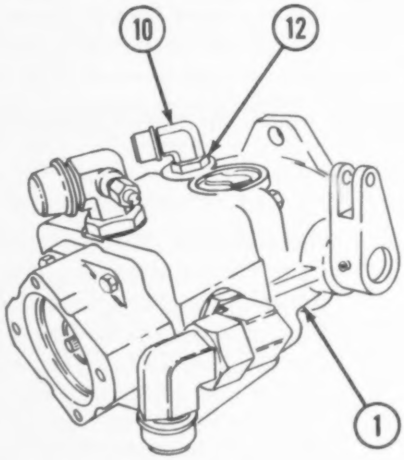
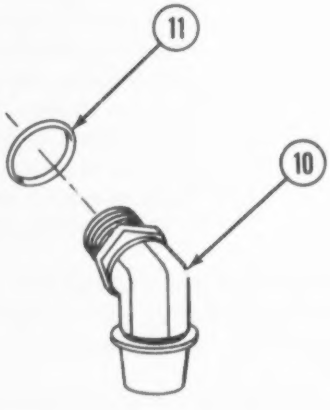
5. INSTALL DRAIN HOSE ELBOW ON LAUNCHER PUMP.
   - Remove plug and cap from pump (1) and elbow (10).
   - Lightly coat elbow (10) and new preformed packing (11) with hydraulic fluid.
   - Install preformed packing (11) on elbow (10).
   - Install elbow (10) on pump (1). Use 12 inch adjustable wrench.
   - Tighten nut (12). Use 1 inch open end wrench.





6. INSTALL LAUNCHER PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-288.)

7. INSTALL OSCILLATOR PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-280.)

8. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

9. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

GO TO NEXT PAGE

## F. LAUNCHER PUMP FITTINGS INSTALLATION — Continued

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

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## G. LAUNCHER PUMP LIP SEALS REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)

1. REMOVE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET FROM DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

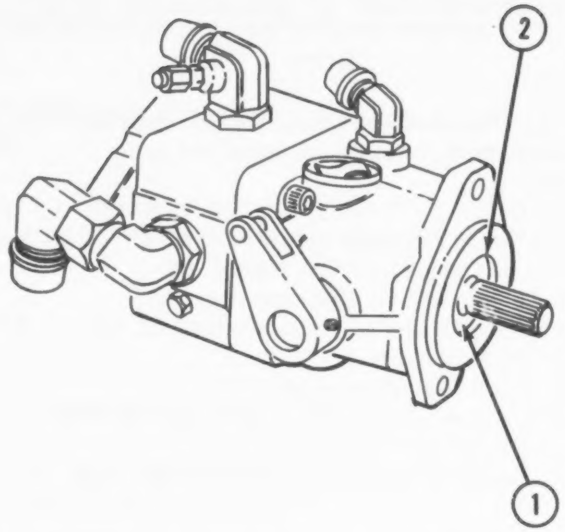
2. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

3. REMOVE OSCILLATOR PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-276.)

4. REMOVE LAUNCHER PUMP FROM DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-284.)

5. REMOVE INPUT SHAFT LIP SEAL FROM LAUNCHER PUMP.
   - Punch hole in seal (1). Use center punch and ball peen hammer.
   - Pry seal (1) from input shaft bore (2). Use center punch. Discard seal.

6. REMOVE LEVER FROM LAUNCHER PUMP TRUNNION SHAFT. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-294.)



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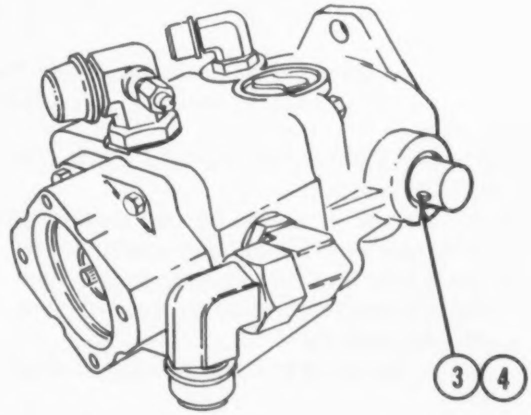
**NOTE**

Launcher pump has two trunnion shaft lip seals. Both seals are removed the same way.

7. REMOVE TWO TRUNNION SHAFT LIP SEALS FROM LAUNCHER PUMP.
   - Punch hole in seal (3). Use center punch and ball peen hammer.
   - Pry seal (3) from shaft bore (4). Use center punch. Discard seal.
   - Repeat above removal steps for other seal.



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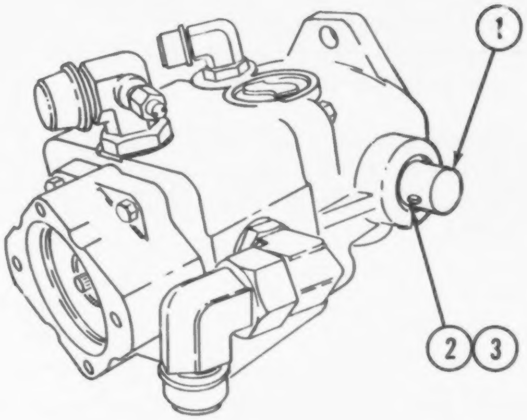
## 15-22 LAUNCHER AND OSCILLATOR PUMPS INSTALLATION — Continued

### H. LAUNCHER PUMP LIP SEALS INSTALLATION

**NOTE**

Launcher pump has two trunnion shaft lip seals. Both seals are installed the same way.



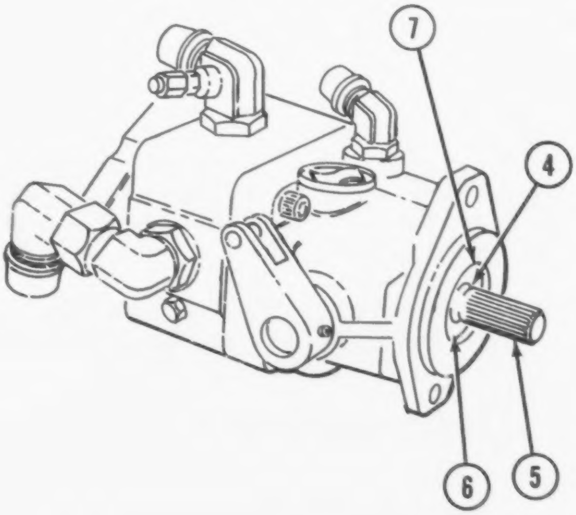
1. INSTALL TWO NEW TRUNNION SHAFT LIP SEALS ON LAUNCHER PUMP.
   - Polish shaft (1). Use crocus cloth.
   - Lubricate shaft (1) and new seal (2). Use hydraulic fluid.
   - Install seal (2) on shaft (1).
   - Seat seal (2) in shaft bore (3). Use mandrel and ball peen hammer.
   - Repeat above installation steps for other seal.
2. INSTALL LEVER ON LAUNCHER PUMP TRUNNION SHAFT. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-295.)

---

**CAUTION**

Splined shaft has sharp edges that can cut seal during installation. Splined shaft must be wrapped to protect seal.

3. INSTALL NEW INPUT SHAFT LIP SEAL ON LAUNCHER PUMP.
   - Polish shaft extension (4). Use crocus cloth.
   - Wrap splined shaft (5). Use plastic sheet.
   - Apply light coat of hydraulic fluid to new seal (6), shaft extension (4), and wrapped splined shaft (5).
   - Install seal (6) over wrapped splined shaft (5).
   - Seat seal (6) in shaft bore (7). Use mandrel and ball peen hammer.
   - Remove plastic sheet from splined shaft (5). Discard plastic sheet.



4. INSTALL LAUNCHER PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-288.)

5. INSTALL OSCILLATOR PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-280.)

6. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

7. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Main Control Panel Assembly Mounting Bracket. (See TM 9-1095-205-20.)
Install Main Control Panel Assembly. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-23 LAUNCHER PUMP LINKAGE ADJUSTMENT

**DESCRIPTION**

This task covers:
A. LAUNCHER WHEEL SPEED MEASUREMENT (p 15-303)
B. LAUNCHER PUMP LINKAGE ADJUSTMENT (p 15-304)

**INITIAL SETUP**

***Tools and Special Tools:***
General mechanic's tool kit
5180-00-177-7033:
3/4 inch open end wrench
6 inch adjustable wrench
Tachometer

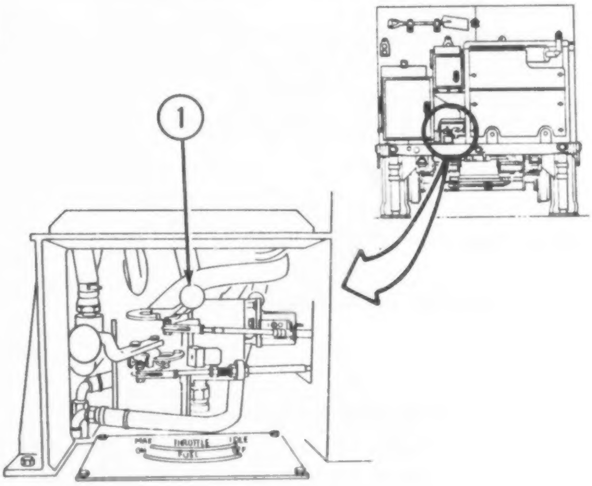
***Personnel Required:***
Mechanic
Helper

***References:***
TM 9-1095-205-10
TM 9-1095-205-20

### A. LAUNCHER WHEEL SPEED MEASUREMENT

**NOTE**

***PRELIMINARY PROCEDURES:***
Connect Operator Control Box. (See TM 9-1095-205-10.)
Remove Front Panel. (See TM 9-1095-205-20.)
Swing Launcher To Far Right. (See TM 9-1095-205-10.)
Open Manual Bypass Valve. (See (TM 9-1095-205-10.)
Open Launcher Wheel Access Door. (See TM 9-1095-205-10.)

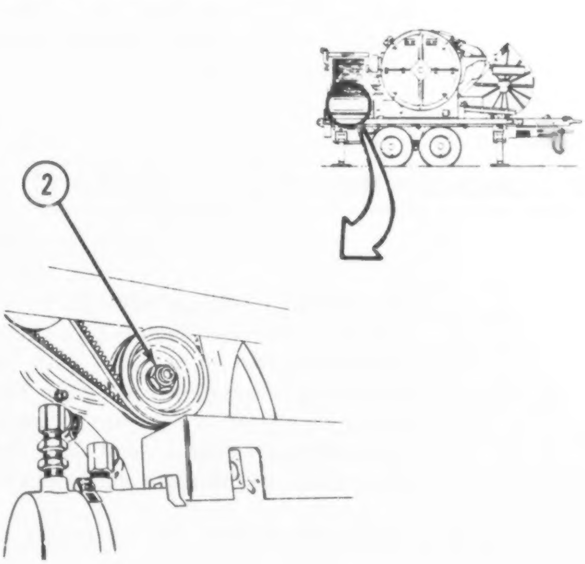


1. SET PATTERN SELECTOR SWITCH ON OPERATOR CONTROL PANEL (OCP) TO J. (SEE TM 9-1095-205-10.)

2 START ENGINE. (SEE TM 9-1095-205-10.)

**WARNING**

Engine parts could hurt you. Stay clear of moving parts when engine is running.



3. ADJUST ENGINE SPEED.
   - Check that throttle lever (1) is at MAX.
   - Allow engine to reach operating temperature.
   - Measure engine speed at crankshaft nut (2). Use tachometer.
   - Move throttle lever (1) to adjust engine speed to 2000 — 2100 rpm. Use tachometer. Use helper.

GO TO NEXT PAGE

## A. LAUNCHER WHEEL SPEED MEASUREMENT—Continued

4. START LAUNCHER.
   - Lift and hold LAUNCHER START switch on OCP to START until LAUNCHER READY light on OCP comes on. (See TM 9-1095-205-10.)
   - Lift and set MODE SELECT switch on OCP to DISPENSE. (See TM 9-1095-205-10.)

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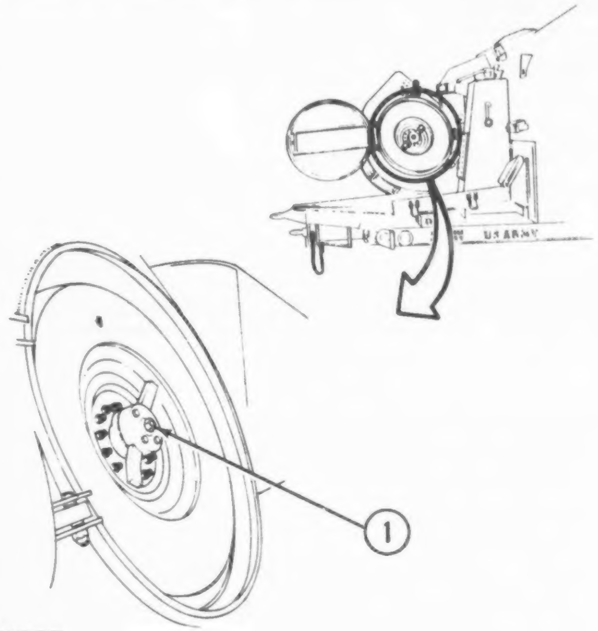
**WARNING**

Parts rotating at high speeds can harm you. Keep objects away from parts rotating at high speeds.



5. MEASURE LAUNCHER WHEEL SPEED.
   - Measure wheel speed at hub (1). Wheel speed should be 1060 — 1120 rpm. Use tachometer.
   - If wheel speed is not correct, adjust linkage turnbuckle. (See Launcher Pump Linkage Adjustment, page 15-305.)
   - If launcher wheel speed is correct, go to step 6.

6. SET MODE SELECT SWITCH ON OCP TO OFF. (SEE TM 9-1095-205-10.)

7. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Close Launcher Wheel Access Door. (See TM 9-1095-205-10.)
Move Manual Bypass Valve To Run. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

---

## B. LAUNCHER PUMP LINKAGE ADJUSTMENT

**NOTE**

***PRELIMINARY PROCEDURES:***

Connect Operator Control Box. (See TM 9-1095-205-10.)
Remove Engine Front Panel. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Swing Launcher To Far Right. (See TM 9-1095-205-10.)
Open Manual Bypass Valve. (See TM 9-1095-205-10.)
Open Launcher Wheel Access Door. (See TM 9-1095-205-10.)

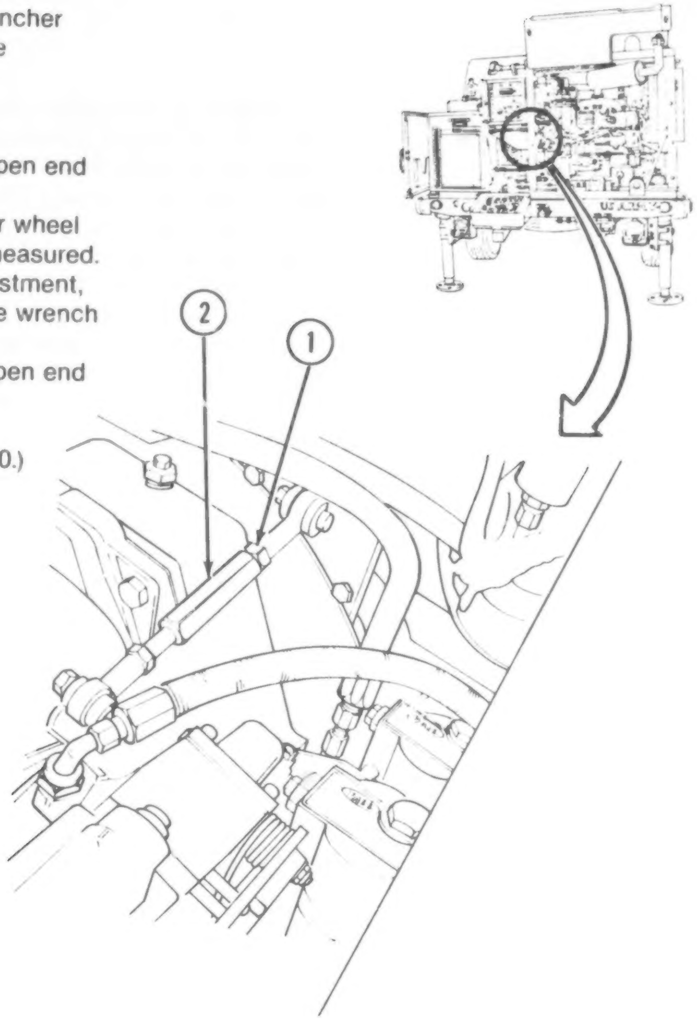
1. MEASURE LAUNCHER WHEEL SPEED. (SEE LAUNCHER PUMP LINKAGE ADJUSTMENT, PAGE 15-303.)

**NOTE**

Shortening turnbuckle decreases launcher wheel speed. Lengthening turnbuckle increases launcher wheel speed.

2. ADJUST LINKAGE TURNBUCKLE.
   - Loosen jam nut (1). Use 3/4 inch open end and 6 inch adjustable wrenches.
   - Adjust turnbuckle (2) until launcher wheel speed is 1060 — 1120 rpm when measured. (See Launcher Pump Linkage Adjustment, Page 15-304.) Use 6 inch adjustable wrench and tachometer. Use helper.
   - Tighten jam nut (1). Use 3/4 inch open end and 6 inch adjustable wrenches.

3. STOP ENGINE. (SEE TM 9-1095-205-20.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Close Launcher Wheel Access Door. (See TM 9-1095-205-10.)
Close Manual Bypass Valve. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Engine Front Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-24 LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR

### DESCRIPTION

This task covers:

A. SERVO ACTUATOR REMOVAL (p 15-308)
B. SERVO ACTUATOR INSTALLATION (p 15-312)
C. SERVO ACTUATOR OPERATIONAL CHECK (p 15-315)
D. SERVO ACTUATOR BACK PLATE ADJUSTMENT (p 15-319)
E. PUMP ASSEMBLY REMOVAL (p 15-320)
F. INPUT AND TRUNNION SHAFTS LIP SEALS REMOVAL (p 15-326)
G. INPUT AND TRUNNION SHAFTS LIP SEALS INSTALLATION (p 15-327)
H. TEE ASSEMBLY DISASSEMBLY (p 15-328)
I. TEE ASSEMBLY REASSEMBLY (p 15-329)
J. SPECIAL PUMP ELBOW ASSEMBLY DISASSEMBLY (p 15-330)
K. SPECIAL PUMP ELBOW ASSEMBLY REASSEMBLY (p 15-330)
L. PUMP ASSEMBLY INSTALLATION (p 15-331)

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### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit 5180-00-177-7033:
- Thickness gage
- Ball peen hammer
- 5/32 inch hex key
- Putty knife
- Center punch
- 6 inch steel rule
- 5/16 inch flat tip screwdriver
- 7/16 inch socket
- 3/8 inch flat tip screwdriver
- 1/4 inch flat tip screwdriver
- 9/16 inch socket
- 5/8 inch socket
- Ratchet handle
- 6 inch adjustable wrench (2)
- 9/16 inch open end wrench
- 11/16 inch open end wrench
- 3/4 inch open end wrench
- 7/8 inch open end wrench
- 1 inch open end wrench
- 7/16 inch box end wrench
- 9/16 inch box end wrench
- 3/8 inch hex key 5120-00-935-4641
- 3/16 inch pin punch 5120-00-293-0791
- 1 1/16 inch open end wrench 5120-00-187-7134
- 1 1/8 inch open end wrench 5120-00-277-2694
- 1 1/4 inch open end wrench 5120-00-187-7134
- Machinist's rule 5210-00-234-5223

***Tools and Special Tools — Continued:***

Funnel 7240-00-559-7364
Drain pan 9410-00-387-9592
Cap and plug set 5340-00-450-5718
Suitable hose
Mandrel (2)

***Materials/Parts:***

Preformed packing (2) 5330-00-804-5695
Self-locking nut (2) 5310-00-088-1251
Self-locking screw (2) 5306-01-163-2429
Self-locking screw (4) (96906) MS18154-6L
Lock washer (2) 5310-00-637-9541
Gasket 5330-01-112-1581
Preformed packing (3) 5330-00-006-2249
Spring pin 5315-00-844-5836
Seal kit 1095-01-152-9896
Preformed packing (2) 5330-00-931-6748
Sealing compound, Item 25, Appendix B
Lubricating oil (see LO 9-1095-205-12), Item 16, Appendix B
Solvent, Item 28, Appendix B
Crocus cloth, Item 4, Appendix B
Plastic sheet, Item 20, Appendix B
Masking tape, Item 19, Appendix B
Adhesive sealant, Item 2, Appendix B
Rags, Item 22, Appendix B

***Personnel Required:***

Mechanic
Helper

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**INITIAL SETUP — Continued**

***References:***
TM 9-1095-205-10
TM 9-1095-205-20
MAGAZINE PUMPS LINKAGE ADJUSTMENT,
Page 15-401

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

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## OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

Seal fluid line fittings. Nonflared fittings, or fittings without seal, gasket, preformed packing, or other sealing hardware, need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

If you disconnect more than one hose assembly, tag and mark each one. Remove tags after connecting hose assemblies.

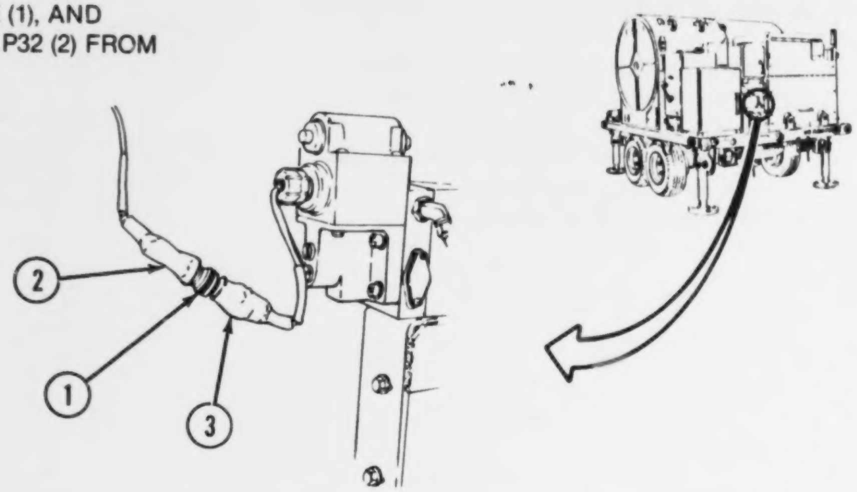
---

## A. SERVO ACTUATOR REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. TURN CONNECTOR SLEEVE (1), AND DISCONNECT CONNECTOR P32 (2) FROM RECEPTACLE J32 (3).



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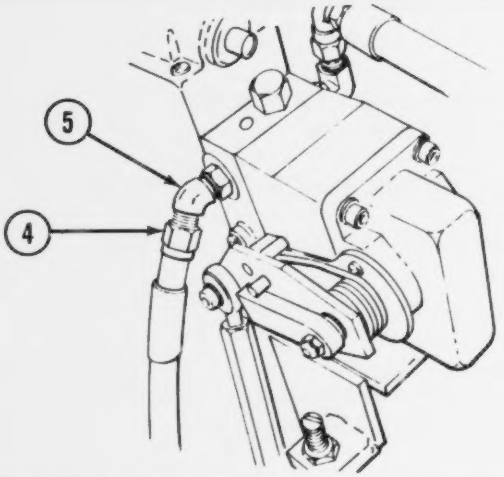
2. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM DRAIN ELBOW.
   - Disconnect hose (4) from elbow (5). Use 3/4 inch open end wrench.
   - Plug hose, and cap elbow.



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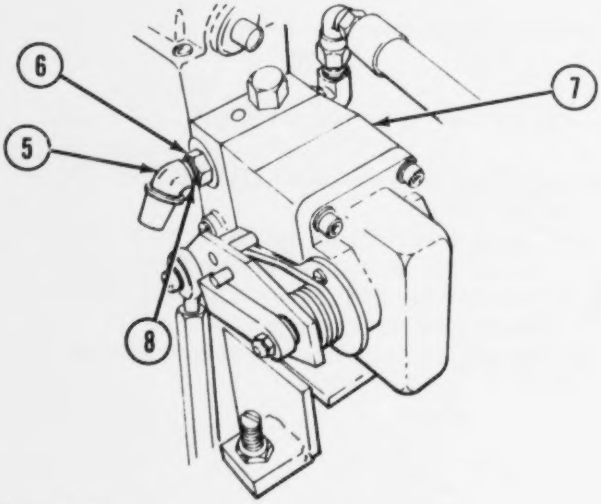
**NOTE**

Do not remove drain elbow unless required for maintenance.

3. REMOVE DRAIN ELBOW FROM SERVO ACTUATOR.
   - Loosen nut (6). Use 11/16 inch open end wrench.
   - Remove elbow (5) from servo actuator (7). Use 6 inch adjustable wrench.
   - Plug servo actuator.
   - Remove preformed packing (8) from elbow (5). Discard preformed packing.
   - Cap elbow.



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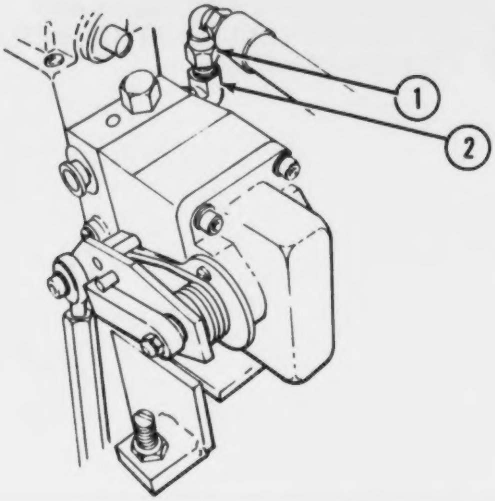
## A. SERVO ACTUATOR REMOVAL — Continued

4. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM CONTROL ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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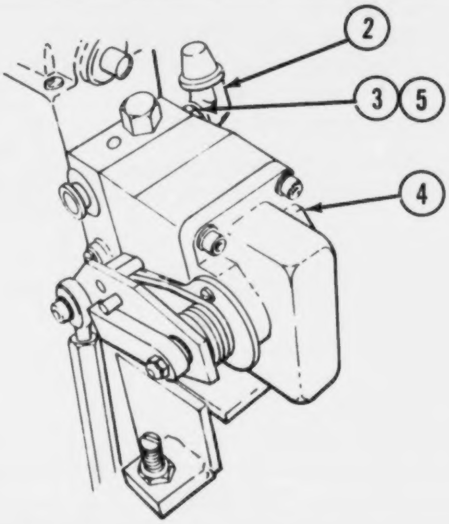
**NOTE**

Do not remove control elbow unless required for maintenance.

5. REMOVE CONTROL ELBOW FROM SERVO ACTUATOR.
   - Loosen nut (3). Use 11/16 inch open end wrench.
   - Remove elbow (2) from servo actuator (4). Use 6 inch adjustable wrench.
   - Plug servo actuator.
   - Remove preformed packing (5) from elbow (2). Discard preformed packing.
   - Cap elbow.



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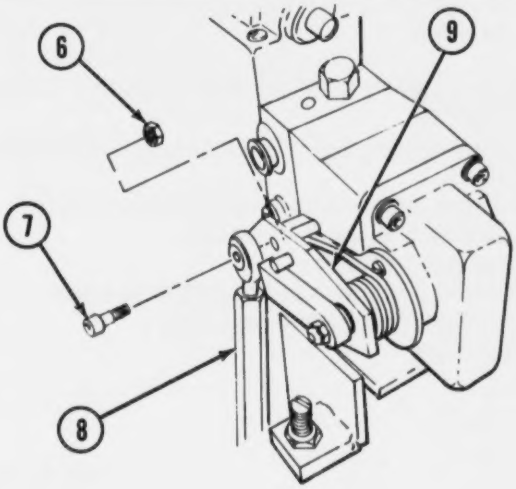
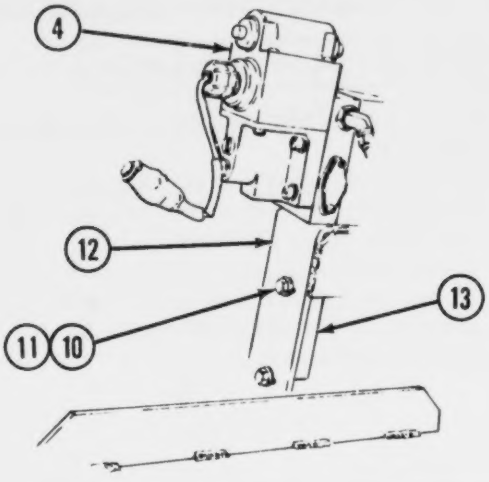
**NOTE**

Do not change turnbuckle length.

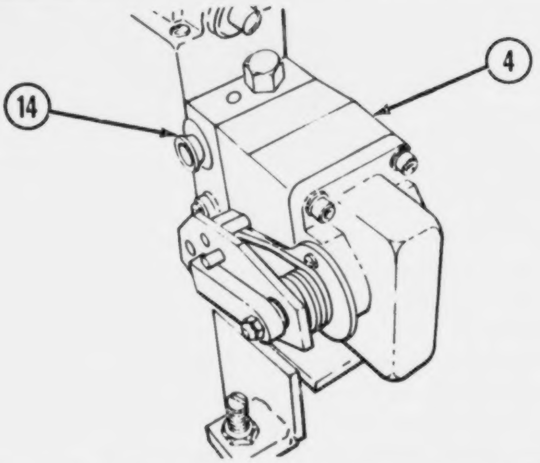
6. DISCONNECT TURNBUCKLE ROD END FROM DRIVE LEVER.
   - Remove self-locking nut (6), screw (7), and turnbuckle (8) from drive lever (9). Use 5/32 inch hex key and 7/16 inch box end wrench. Discard self-locking nut.
   - Move turnbuckle (8) clear of lever arm (9).



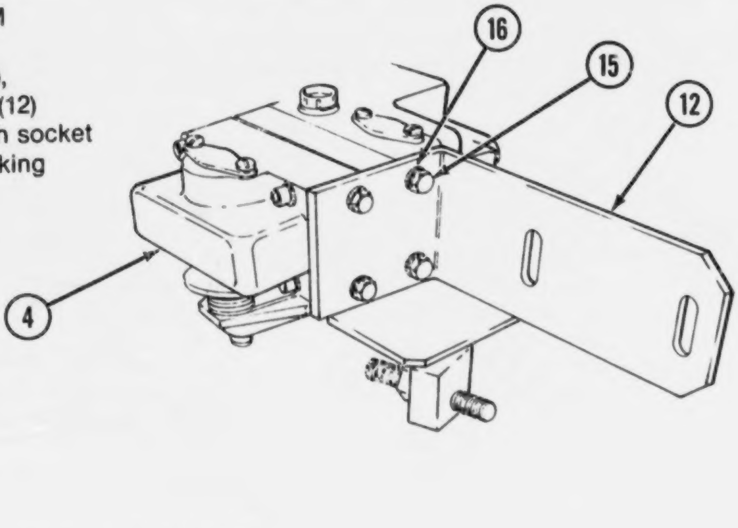
7. REMOVE MOUNTING BRACKET WITH SERVO ACTUATOR FROM LEFT MAGAZINE PUMP ASSEMBLY.
   - Remove two self-locking screws (10), washers (11), and mounting bracket (12) with servo actuator (4) from pump (13). Use 9/16 inch socket with ratchet handle. Discard self-locking screws.



8. DRAIN OIL FROM SERVO ACTUATOR.
   - Remove plugs from two ports (14) on servo actuator (4).
   - Drain oil. Use drain pan.
   - Plug servo actuator.
   - Dispose of drained oil according to local procedures.



9. REMOVE MOUNTING BRACKET FROM SERVO ACTUATOR.
   - Remove four self-locking screws (15), washers (16), and mounting bracket (12) from servo actuator (4). Use 7/16 inch socket with ratchet handle. Discard self-locking screws.



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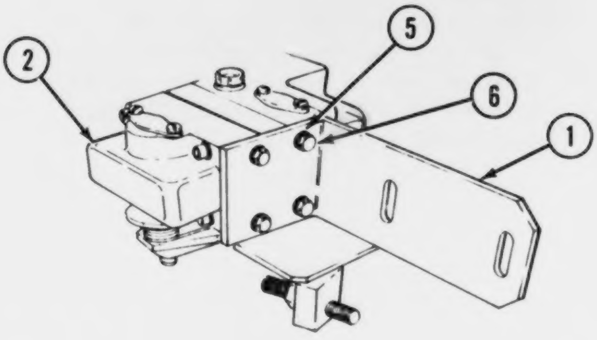
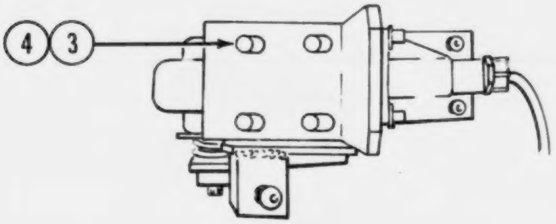
## 15-24 LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR — Continued

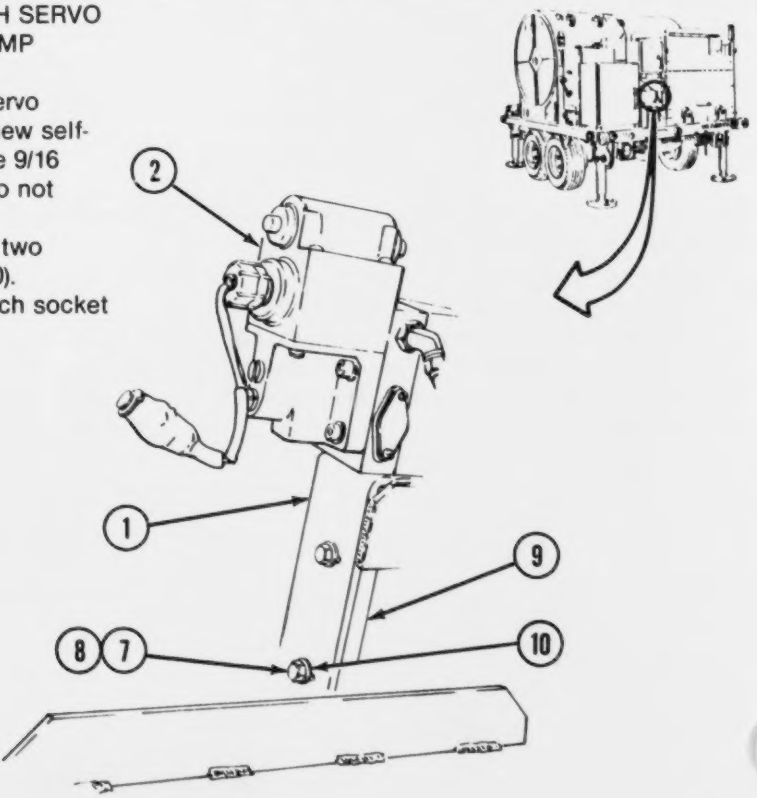
### B. SERVO ACTUATOR INSTALLATION

1. INSTALL MOUNTING BRACKET ON SERVO ACTUATOR.
   - Position mounting bracket (1) on servo actuator (2), with left end of four slots (3) and screw holes (4) alined.
   - Install mounting bracket (1), four washers (5), and new self-locking screws (6) on servo actuator (2). Use 7/16 inch socket with ratchet handle.





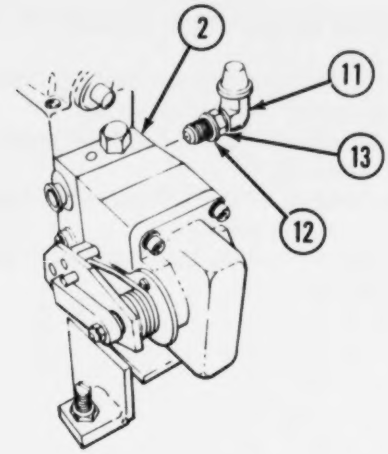
2. INSTALL MOUNTING BRACKET WITH SERVO ACTUATOR ON LEFT MAGAZINE PUMP ASSEMBLY.
   - Install mounting bracket (1) with servo actuator (2), two washers (7), and new self-locking screws (8) on pump (9). Use 9/16 inch socket with ratchet handle. Do not tighten.
   - Position mounting bracket (1) with two screws (8) centered in two slots (10).
   - Tighten two screws (8). Use 9/16 inch socket with ratchet handle.



**NOTE**

If control elbow was not removed, go to step 4.

3. INSTALL CONTROL ELBOW ON SERVO ACTUATOR.
   - Remove plug and cap from servo actuator (2) and elbow (11).
   - Apply light coat of hydraulic fluid to new preformed packing (12).
   - Install preformed packing (12) on elbow (11).
   - Install elbow (11) on servo actuator (2) with elbow pointing up. Use 6 inch adjustable wrench. Do not tighten nut (13).



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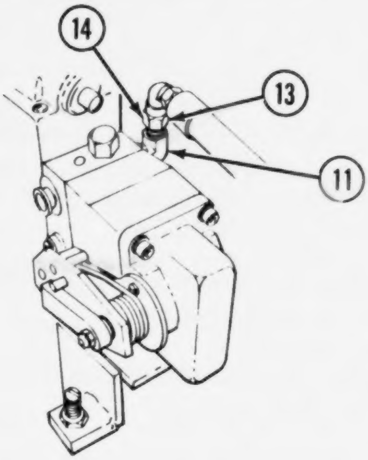
4. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO CONTROL ELBOW.
   - Remove plug and cap from hose (14) and elbow (11).
   - Connect hose (14) to elbow (11). Use 11/16 inch open end wrench.
   - Tighten nut (13). Use 11/16 inch open end wrench.



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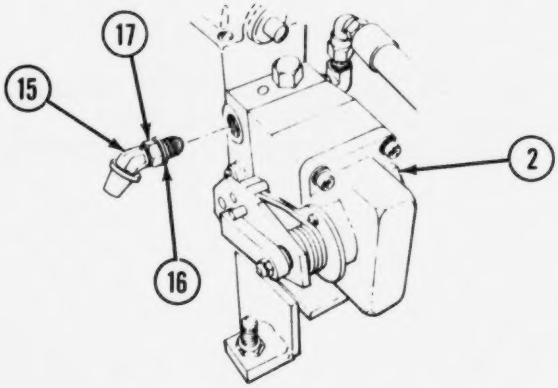
**NOTE**

If drain elbow was not removed, go to step 6.

5. INSTALL DRAIN ELBOW ON SERVO ACTUATOR.
   - Remove plug and cap from servo actuator (2) and elbow (15).
   - Apply light coat of hydraulic fluid to new preformed packing (16).
   - Install preformed packing (16) on elbow (15).
   - Install elbow (15) on servo actuator (2), with elbow pointing down. Use 6 inch adjustable wrench. Do not tighten nut (17).



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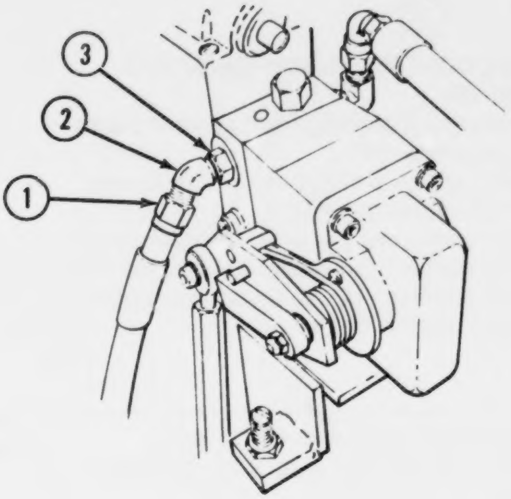
## B. SERVO ACTUATOR INSTALLATION — Continued

6. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO DRAIN ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 3/4 inch open end wrench.
   - Tighten nut (3). Use 11/16 inch open end wrench.



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7. CONNECT CONNECTOR P32 (4) TO RECEPTACLE J32 (5), AND TURN CONNECTOR SLEEVE (6).

8. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

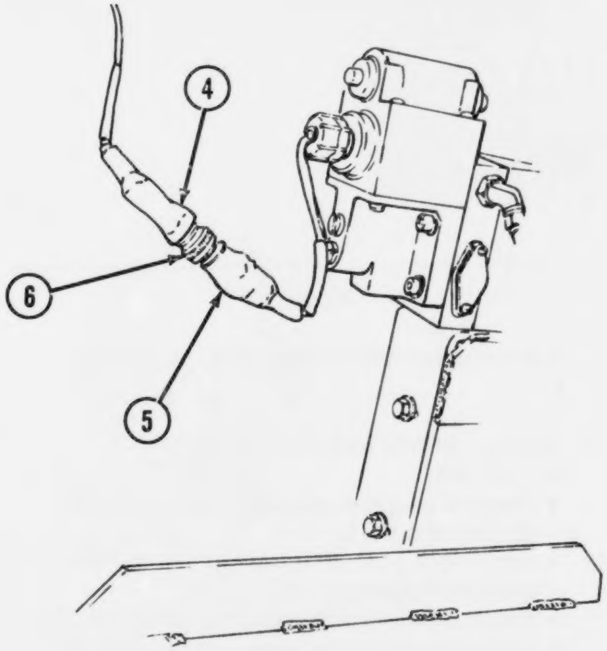
9. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

10. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)

11. PLACE HYDRAULIC SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)

12. STOP ENGINE. (SEE TM 9-1095-205-20.)

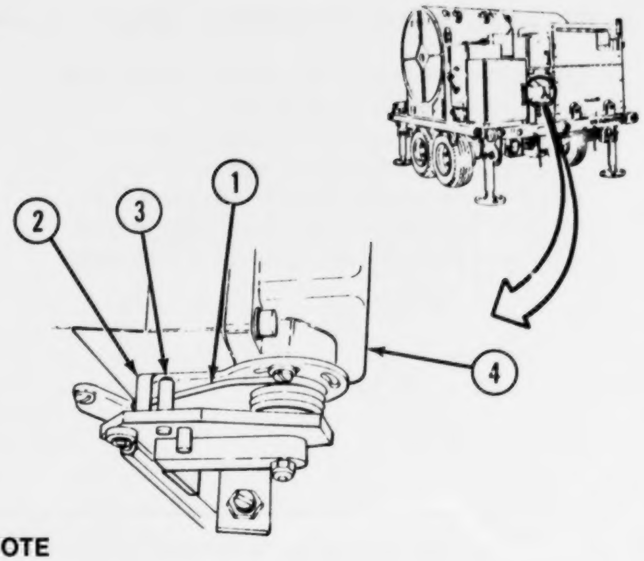
13. PERFORM SERVO ACTUATOR OPERATIONAL CHECK. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-315.)



## C. SERVO ACTUATOR OPERATIONAL CHECK

**NOTE**

***PRELIMINARY PROCEDURE:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)



1. INSPECT SPRING AND SPRING LOCATION.
    - Check that two ends of spring (1) are held by two backplate retainers (2) and drive lever pins (3).
    - If spring (1) is broken or is not held by two backplate retainers (2) and drive lever pins (3), servo actuator (4) is faulty.

**NOTE**

Do not change turnbuckle length.

2. DISCONNECT TURNBUCKLE ROD END FROM DRIVE LEVER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-310.)
3. START ENGINE. (SEE TM 9-1095-205-10.)
4. SET MODE SELECT SWITCH ON OPERATOR CONTROL BOX (OCB) TO OFF. (SEE TM 9-1095-205-10.)
5. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)

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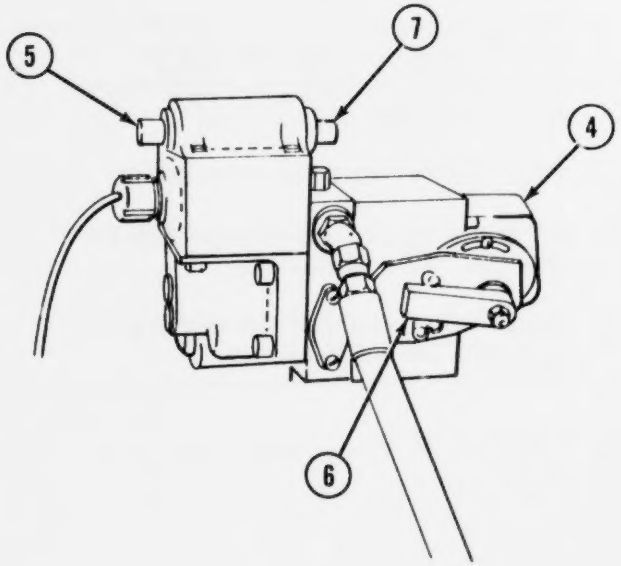
6. CHECK LEVER ARM NEUTRAL POSITION.
    - Press left manual override button (5). Lever arm (6) should move down.
    - Release left override button (5). Lever arm (6) should return to neutral (center).
    - If lever arm (6) does not move down or does not return to neutral, servo actuator (4) is faulty.
    - Press right manual override button (7). Lever arm (6) should move up.
    - Release right override button (7). Lever arm (6) should return to neutral (center).
    - If lever arm (6) does not move up or does not return to neutral, servo actuator (4) is faulty.



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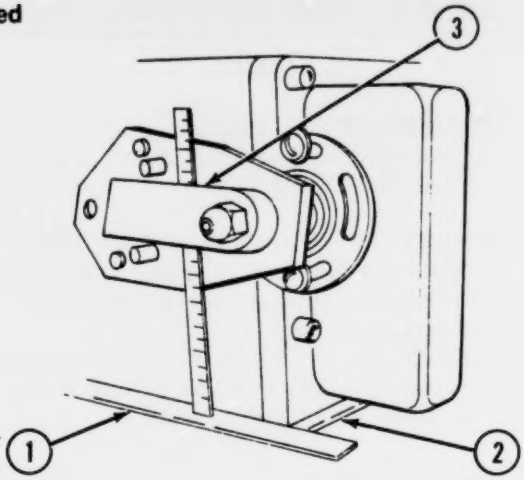
## C. SERVO ACTUATOR OPERATIONAL CHECK — Continued

7. MEASURE DISTANCE BETWEEN LEVER ARM AND SERVO ACTUATOR BASE.
   - Position straight edge (1) along base of servo actuator (2). Use machinist's rule.
   - Measure and note distance between right top of lever arm (3) and straight edge (1) at base of servo actuator (2). Use 6 inch steel rule.



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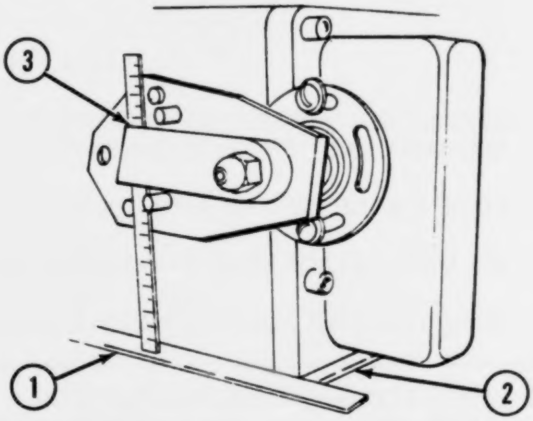
- Measure and note distance between left top of lever arm (3) and straight edge (1) at base of servo actuator (2). Use 6 inch steel rule.
- If difference between two measurements is less than 1/8 in. (3.2 mm), go to step 18.
- If difference between two measurements is greater than 1/8 in. (3.2 mm), stop engine. (See TM 9-1095-205-20.)



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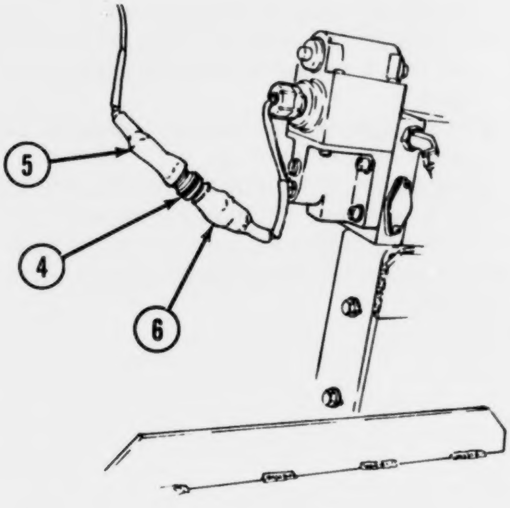
8. TURN CONNECTOR SLEEVE (4), AND DISCONNECT CONNECTOR P32 (5) FROM RECEPTACLE J32 (6).

9. START ENGINE. (SEE TM 9-1095-205-10.)

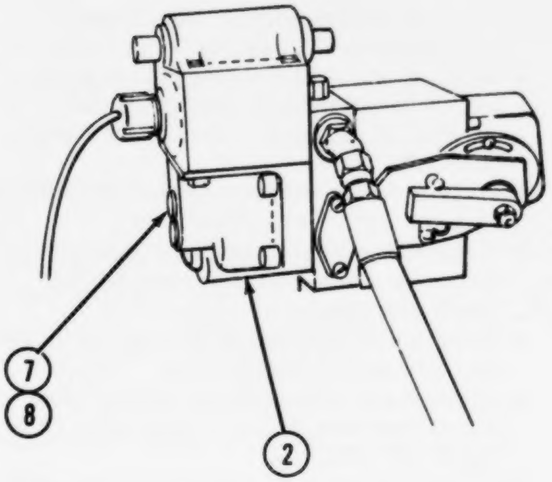
10. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)

11. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



12. ADJUST NULL SCREW.
    - Remove cap (7) from servo actuator (2). Use 3/8 inch flat tip screwdriver.
    - Turn null screw (8) until difference between two measurements in step 7 is less than 1/8 in. (3.2 mm). Use 1/4 inch flat tip screwdriver.
    - Install cap (7) on servo actuator (2). Use 3/8 inch flat tip screwdriver.

13. STOP ENGINE. (SEE TM 9-1095-205-20.)



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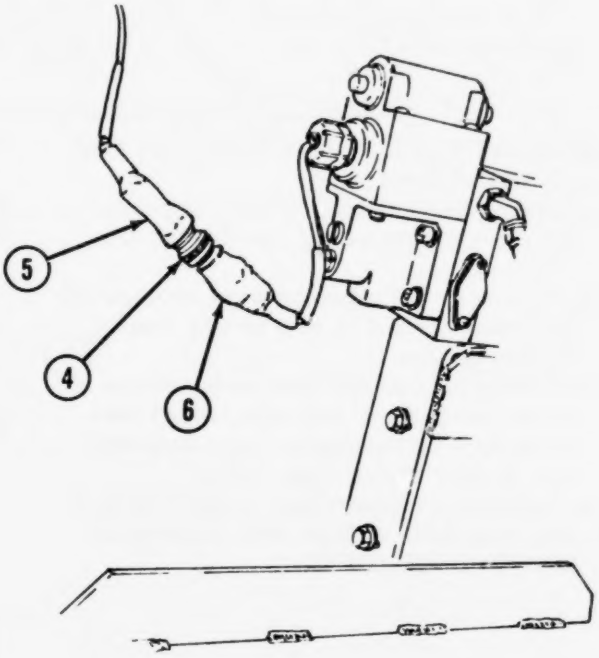
14. CONNECT CONNECTOR P32 (5) TO RECEPTACLE J32 (6), AND TURN CONNECTOR SLEEVE (4).

15. START ENGINE. (SEE TM 9-1095-205-10.)

16. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)

17. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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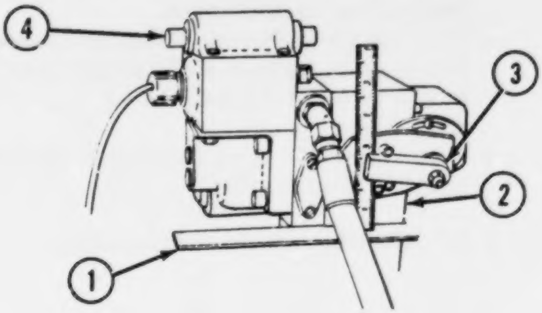
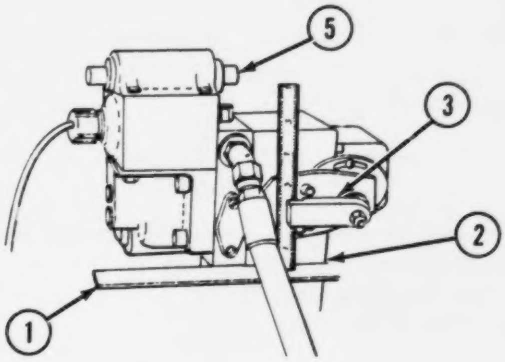
## C. SERVO ACTUATOR OPERATIONAL CHECK — Continued

18. CHECK LEVER ARM TRAVEL.
    - Position straight edge (1) along base of servo actuator (2). Use machinist's rule.
    - Measure and note distance between top end of lever arm (3), in neutral (center) position, and straight edge (1). Use 6 inch steel rule.
    - Press and hold left manual override button (4). Lever arm (3) will move down.
    - Measure and note distance between top end of lever arm (3) and straight edge (1). Use 6 inch steel rule.
    - Press and hold right manual override button (5). Lever arm (3) will move up.
    - Measure and note distance between top end of lever arm (3) and straight edge (1). Use 6 inch steel rule.
    - If difference in up and down travel distance from neutral position is more than 1/8 in. (3.2 mm), servo actuator (2) is faulty.





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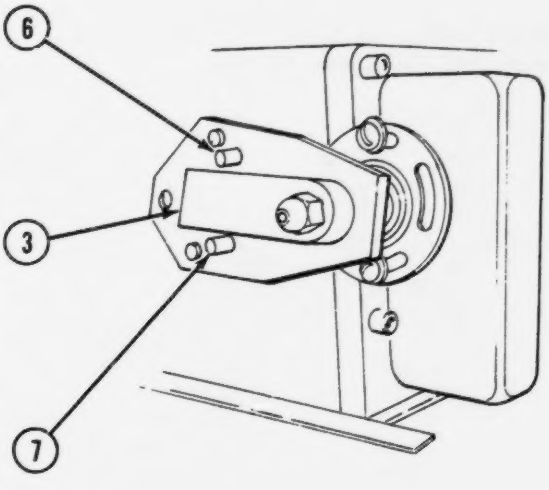
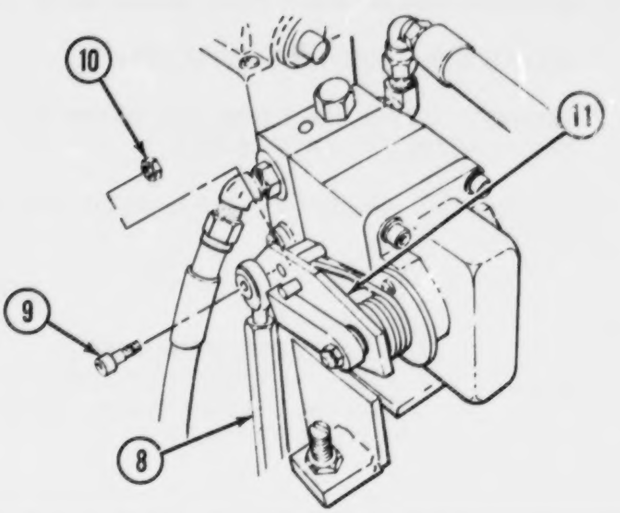
19. MEASURE DISTANCE BETWEEN LEVER ARM AND SPRING PINS.
    - Measure and note gap between upper pin (6) and upper surface of lever arm (3). Use thickness gage.
    - Measure and note gap between lower pin (7) and lower surface of lever arm (3). Use thickness gage.
    - If difference between two measurements is more than 0.030 in. (0.76 mm), adjust back plate. (See Left Magazine Pump Assembly and Servo Actuator, Page 15-319.)
    - If difference between two measurements is less than 0.030 in. (0.76 mm), stop engine. (See TM 9-1095-205-20.)



20. CONNECT TURNBUCKLE ROD END TO DRIVE LEVER.
    - Install turnbuckle (8), screw (9), and new self-locking nut (10) on drive lever (11). Use 5/32 inch hex key and 7/16 inch box end wrench.

21. ADJUST LEFT MAGAZINE PUMP LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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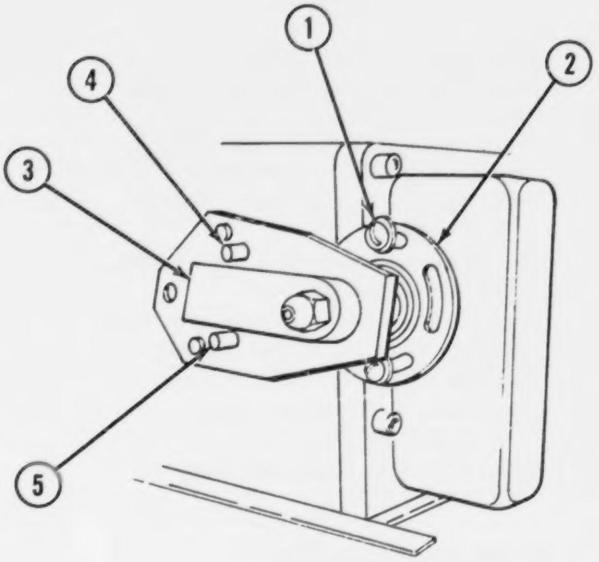
## D. SERVO ACTUATOR BACK PLATE ADJUSTMENT

**NOTE**

***PRELIMINARY PROCEDURE:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)



1. DISCONNECT TURNBUCKLE ROD END FROM DRIVE LEVER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-310.)

2. START ENGINE. (SEE TM 9-1095-205-10.)

3. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)

4. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)

5. ADJUST BACK PLATE.
    - Loosen two screws (1) until back plate (2) moves freely. Use 5/16 inch flat tip screwdriver.
    - Rotate back plate (2) until lever arm (3) is centered between upper pin (4) and lower pin (5). Use thickness gage.
    - Tighten two screws (1). Use 5/16 inch flat tip screwdriver.

GO TO NEXT PAGE

## D. SERVO ACTUATOR BACK PLATE ADJUSTMENT—Continued

6. STOP ENGINE. (SEE TM 9-1095-205-20.)
7. CONNECT TURNBUCKLE ROD END TO DRIVE LEVER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-319.)
8. ADJUST LEFT MAGAZINE PUMP LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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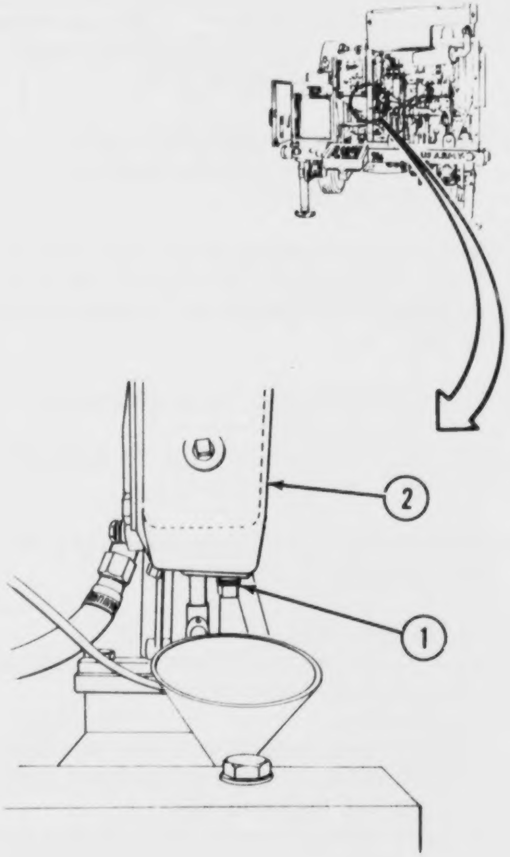
## E. PUMP ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Mounting Bracket. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DRAIN PUMP ASSEMBLY.
   - Remove drain plug (1) from pump assembly (2), and drain hydraulic fluid. Use 9/16 inch open end wrench, funnel, suitable hose, and drain pan.
   - Install drain plug (1) in pump assembly (2). Use 9/16 inch open end wrench.
   - Dispose of drained fluid according to local procedures.

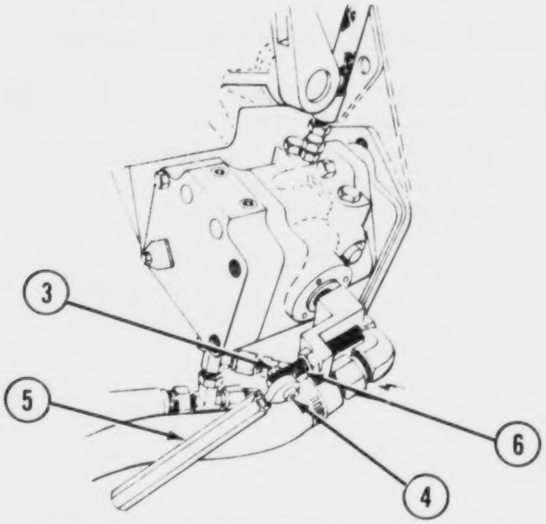


2. REMOVE SERVO ACTUATOR FROM LEFT MAGAZINE PUMP ASSEMBLY. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-308.)

**NOTE**

Do not change turnbuckle length when removing turnbuckle.

3. REMOVE TURNBUCKLE FROM ADJUSTING ROD.
   - Remove self-locking nut (3), screw (4), and turnbuckle (5) from adjusting rod (6). Use 5/32 inch hex key and 7/16 inch box end wrench. Discard self-locking nut.



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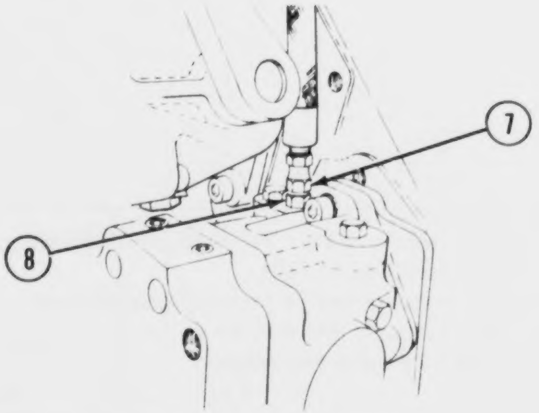
4. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (7) from adapter (8). Use 11/16 inch open end wrench.
   - Plug hose, and cap adapter.



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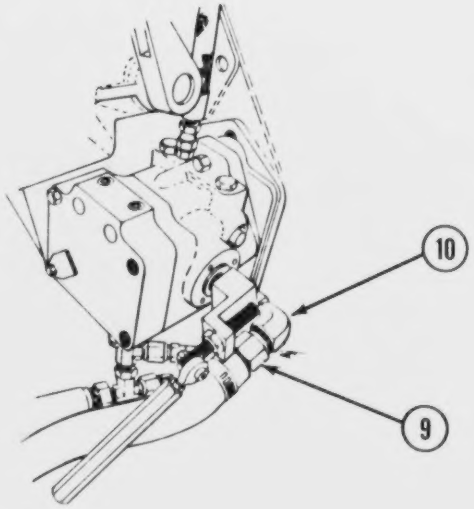
5. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW ASSEMBLY.
   - Disconnect hose (9) from elbow assembly (10). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap elbow assembly.



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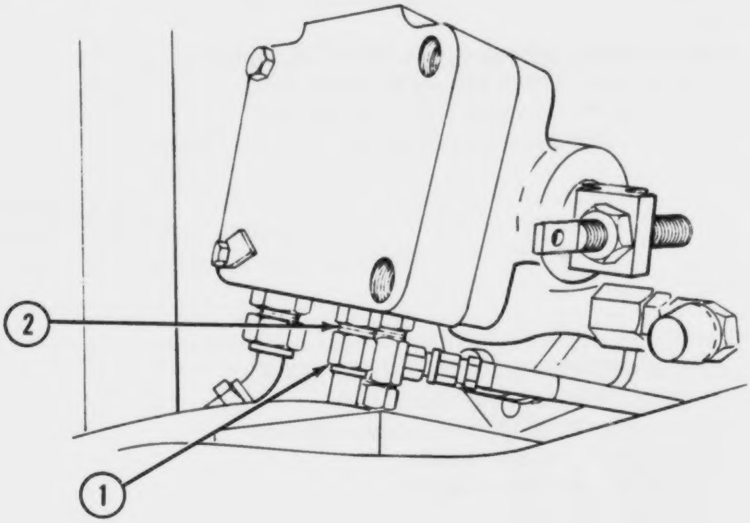
## E. PUMP ASSEMBLY REMOVAL — Continued

6. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



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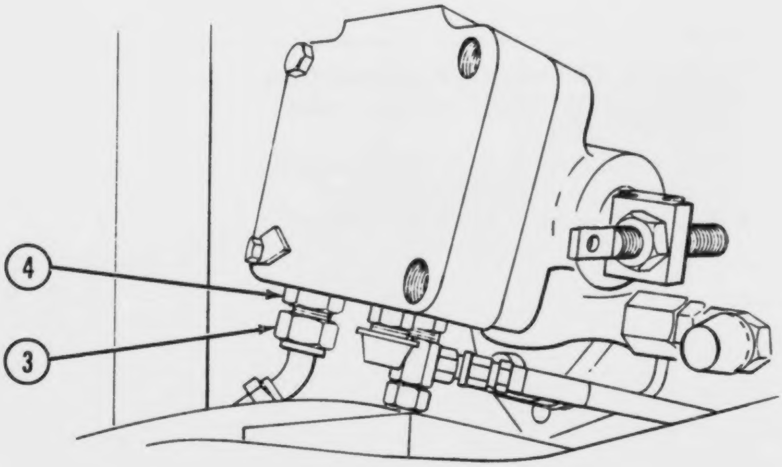
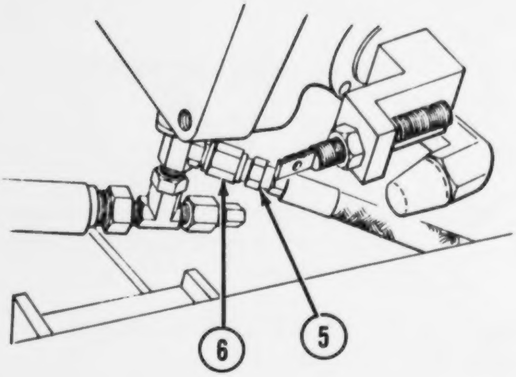
7. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (3) from adapter (4). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



8. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM TEE ASSEMBLY REDUCER.
   - Disconnect hose (5) from reducer (6). Use 11/16 inch open end wrench.
   - Plug hose, and cap reducer.



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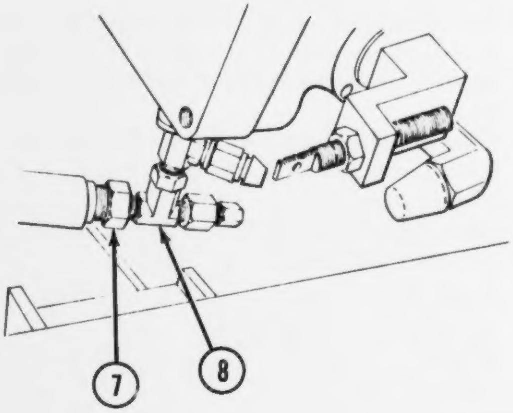
9. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM TEE ASSEMBLY REDUCER.
   - Disconnect hose (7) from reducer (8). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap reducer.



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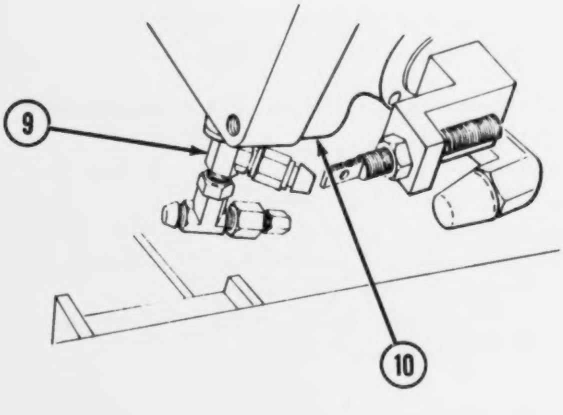
10. REMOVE TEE ASSEMBLY FROM PUMP.
    - Remove tee assembly (9) from pump (10). Use 1 1/8 inch open end wrench.
    - Plug pump, and cap tee assembly.

**NOTE**

Do not disassemble tee assembly unless required for maintenance.

11. DISASSEMBLE TEE ASSEMBLY. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-328.)



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### E. PUMP ASSEMBLY REMOVAL — Continued

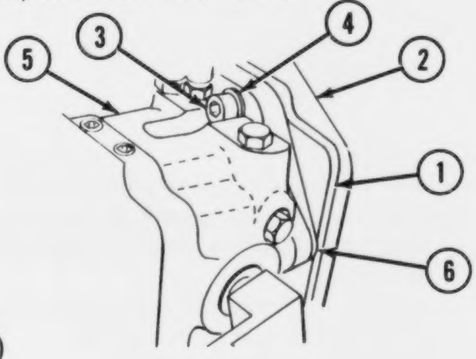
**WARNING**

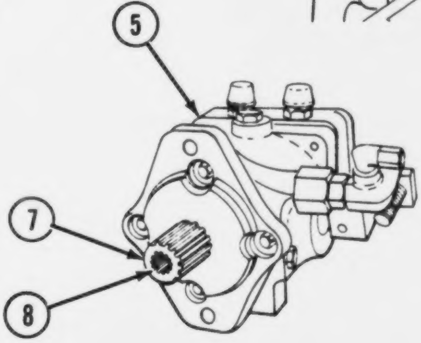
Cleaning solvent can explode and can burn. Read warning on front page of this manual.

**CAUTION**

Pump adapter can fall and damage parts when pump is removed from pump drive assembly. Hold adapter in place on pump drive assembly during pump removal.

12. REMOVE LEFT MAGAZINE PUMP FROM PUMP DRIVE ASSEMBLY.
    - Have helper hold adapter plate (1) on drive assembly (2). Remove two screws (3), lock washers (4), pump (5), and gasket (6) from drive assembly. Use 3/8 inch hex key. Discard lock washers and gasket.
    - Install two screws (3) and adapter plate (1) on drive assembly (2). Use 3/8 inch hex key.
    - Remove splined adapter (7) from pump shaft (8).
    - Clean gasket mating surfaces on pump (5) and adapter plate (1). Use putty knife, solvent, and rags.
    - Cover adapter plate (1). Use plastic sheet and masking tape.





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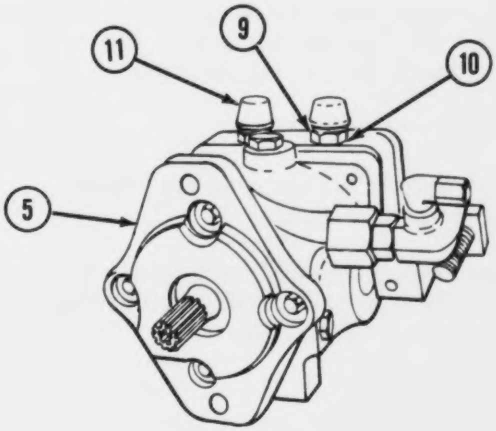
**NOTE**

Do not remove feed line pump adapters unless required for maintenance.

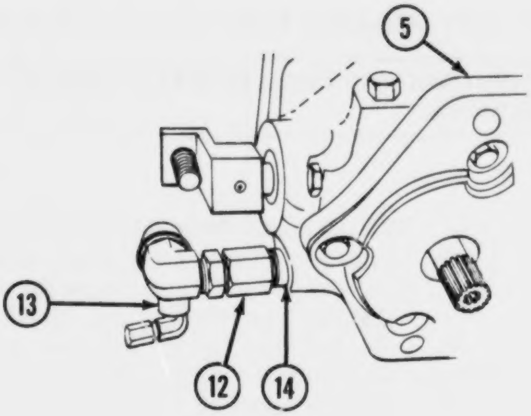
13. REMOVE TWO FEED LINE PUMP ADAPTERS FROM PUMP.
    - Remove adapter (9) from pump (5). Use 7/8 inch open end wrench.
    - Remove preformed packing (10) from adapter (9). Discard preformed packing.
    - Plug pump, and cap adapter.
    - Repeat above removal steps for other adapter (11).



**NOTE**

Do not remove special pump elbow assembly unless required for maintenance.

14. REMOVE SPECIAL PUMP ELBOW ASSEMBLY FROM PUMP.
    - Turn pump (5) over.
    - Remove adapter (12) with elbow assembly (13) from pump (5). Use 1 1/8 inch open end wrench.
    - Remove preformed packing (14) from adapter (12). Discard preformed packing.
    - Plug pump, and cap adapter.



**NOTE**

Do not disassemble special pump elbow assembly unless required for maintenance.

15. DISASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-330.)

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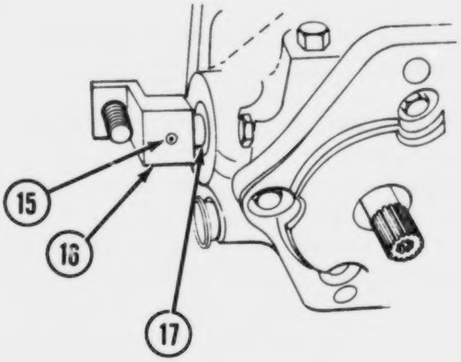
**NOTE**

Do not remove arm assembly unless required for maintenance or to replace trunnion shaft lip seals.

16. REMOVE ARM ASSEMBLY FROM TRUNNION SHAFT.
    - Remove spring pin (15) from arm assembly (16) and trunnion shaft (17). Use 3/16 inch pin punch and ball peen hammer. Discard spring pin.
    - Remove arm assembly (16) from trunnion shaft (17).



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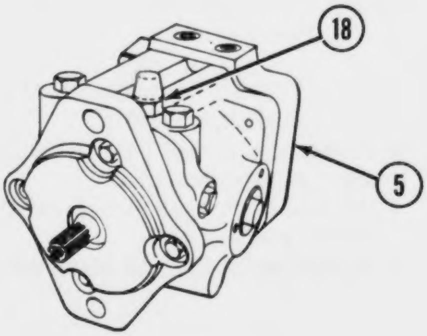
**NOTE**

Do not remove servo filter feed adapter unless required for maintenance.

17. REMOVE SERVO FILTER FEED ADAPTER FROM PUMP.
    - Remove adapter (18) from pump (5). Use 5/8 inch socket with ratchet handle.
    - Plug pump, and cap adapter.



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## 15-24 LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR — Continued

### F. INPUT AND TRUNNION SHAFTS LIP SEALS REMOVAL

**NOTE**

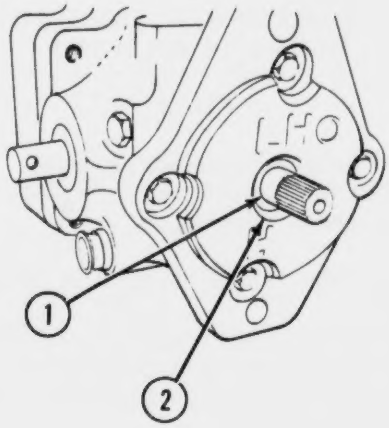
***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Mounting Bracket. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. REMOVE LEFT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-320.)

**NOTE**

If removing only trunnion shaft lip seals, go to step 3.

2. REMOVE INPUT SHAFT LIP SEAL FROM INPUT SHAFT.
   - Punch hole in seal (1). Use center punch and ball peen hammer.
   - Pry seal (1) from input shaft bore (2). Use center punch. Discard seal.



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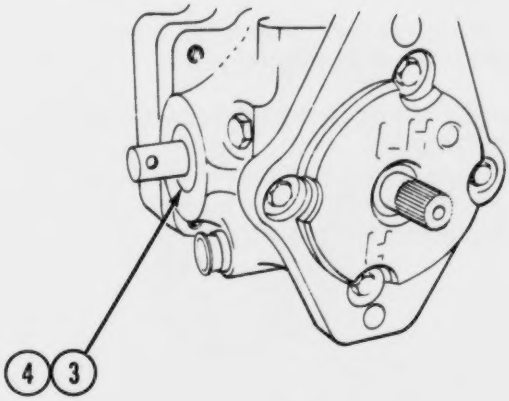
**NOTE**

Left magazine pump assembly has two trunnion shaft lip seals. Both seals are removed the same way.

3. REMOVE TWO TRUNNION SHAFT LIP SEALS FROM TRUNNION SHAFT.
   - Punch hole in seal (3). Use center punch and ball peen hammer.
   - Pry seal (3) from shaft bore (4). Use center punch. Discard seal.
   - Repeat above removal steps for other seal.



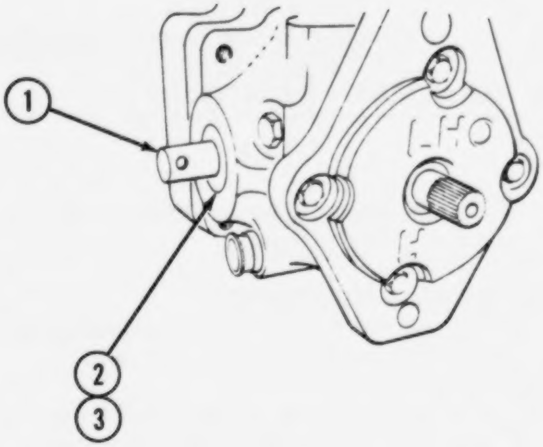
## G. INPUT AND TRUNNION SHAFTS LIP SEALS INSTALLATION

**NOTE**

If installing only input shaft lip seal, go to step 2.

• • • •

Left magazine pump assembly has two trunnion shaft lip seals. Both seals are installed the same way.

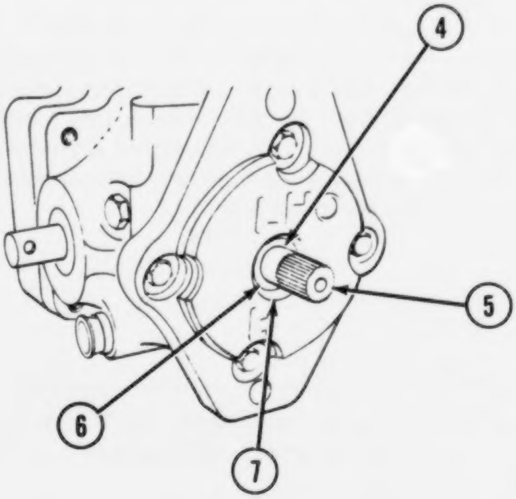


1. INSTALL TWO TRUNNION SHAFT LIP SEALS ON TRUNNION SHAFT.
   - Polish shaft (1). Use crocus cloth.
   - Lubricate shaft (1) and new seal (2). Use hydraulic fluid.
   - Install seal (2) over shaft (1).
   - Seat seal (2) in shaft bore (3). Use mandrel and ball peen hammer.
   - Repeat above installation steps for other seal.

---

**CAUTION**

Splined shaft has sharp edges that can cut seal during installation. Splined shaft must be wrapped to protect seal.



2. INSTALL INPUT SHAFT LIP SEAL ON INPUT SHAFT.
   - Polish shaft extension (4). Use crocus cloth.
   - Wrap splined shaft (5). Use plastic sheet.
   - Apply light coat of hydraulic fluid to new seal (6), shaft extension (4), and wrapped splined shaft (5).
   - Install seal (6) over wrapped splined shaft (5).
   - Seat seal (6) in shaft bore (7). Use mandrel and ball peen hammer.
   - Remove plastic wrapping sheet from splined shaft (5). Discard plastic sheet wrapping.
3. INSTALL LEFT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-331.)

GO TO NEXT PAGE

## G. INPUT AND TRUNNION SHAFTS LIP SEALS INSTALLATION — Continued

NOTE

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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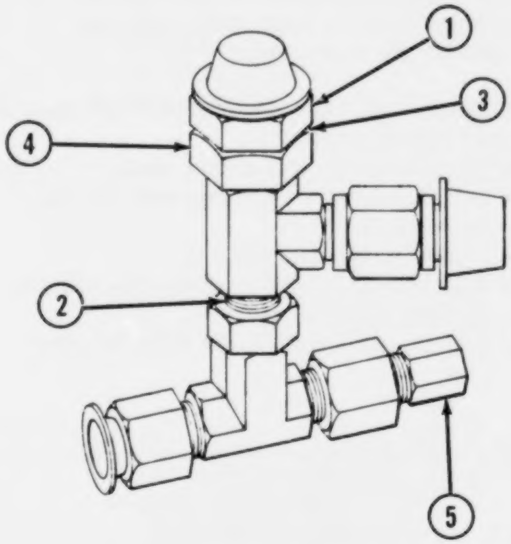
## H. TEE ASSEMBLY DISASSEMBLY

NOTE

Do not disassemble tee assembly unless required for maintenance.

DISASSEMBLE TEE ASSEMBLY.

- Remove reducer (1) from tee assembly (2). Use 1 1/8 inch and 1 inch open end wrenches.
- Remove preformed packing (3) from tee assembly (2). Discard preformed packing.
- Plug reducer, and cap tee assembly.
- Remove reducer (4) from tee assembly (2). Use 1 inch open end and 6 inch adjustable wrenches.
- Plug reducer, and cap tee assembly.
- Remove tube cap (5) from tee assembly (2). Use 9/16 inch box end and 1 inch open end wrenches.
- Plug tube cap, and cap tee assembly.



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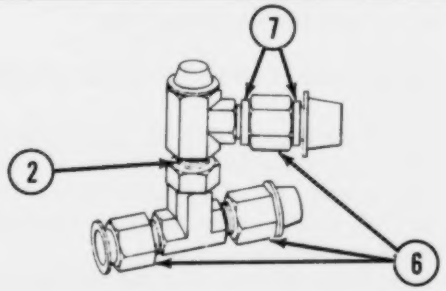
- Remove tube coupling nuts (6) and reducer tubes (7) from tee assembly (2). Use 1 inch open end and 6 inch adjustable wrenches.
- Plug tube coupling nuts and reducer tubes, and cap tee assembly.



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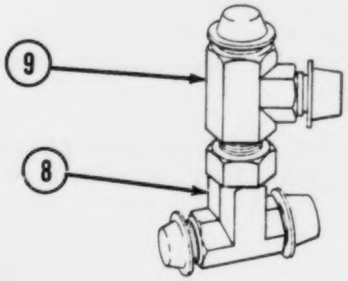
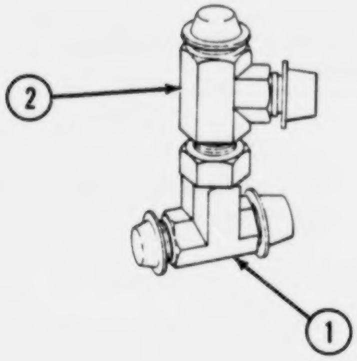
- Remove swivel tee (8) from tee (9). Use 1 inch open end and 6 inch adjustable wrenches.
- Plug swivel tee, and cap tee.



## I. TEE ASSEMBLY REASSEMBLY

REASSEMBLE TEE ASSEMBLY.

- Remove plug and cap from swivel tee (1) and tee (2).
- Install swivel tee (1) on tee (2). Use 1 inch open end and 6 inch adjustable wrenches.



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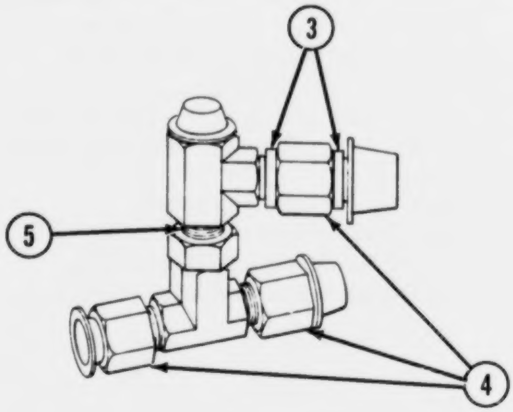
- Remove plugs and caps from reducer tubes (3), tube coupling nuts (4), and tee assembly (5).
- Install reducer tubes (3) and tube coupling nuts (4) on tee assembly (5). Use 1 inch open end and 6 inch adjustable wrenches.



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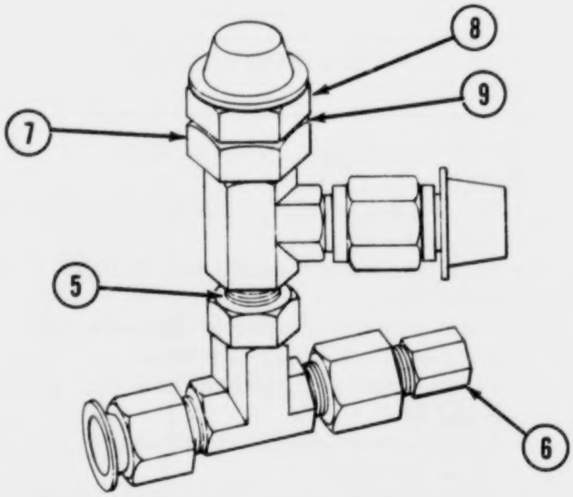
- Remove plug and cap from tube cap (6) and tee assembly (5).
- Install tube cap (6) on tee assembly (5). Use 9/16 inch box end and 1 inch open end wrenches.
- Remove plug and cap from reducer (7) and tee assembly (5).
- Install reducer (7) on tee assembly (5). Use 1 inch open end and 6 inch adjustable wrenches.
- Remove plug and cap from reducer (8) and tee assembly (5).
- Apply light coat of oil to new preformed packing (9).
- Install preformed packing (9) on tee assembly (5).
- Install reducer (8) on tee assembly (5). Use 1 1/8 inch and 1 inch open end wrenches.



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## 15-24 LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR — Continued

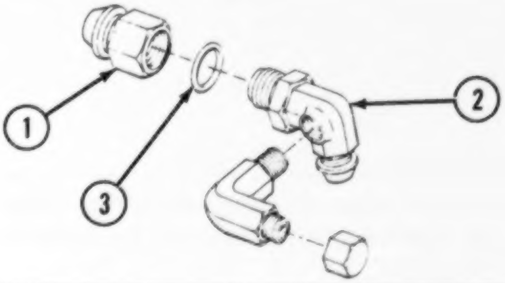
### J. SPECIAL PUMP ELBOW ASSEMBLY DISASSEMBLY

**NOTE**

Do not disassemble special pump elbow assembly unless required for maintenance.

DISASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY.

- Remove adapter (1) from special elbow (2). Use 1 1/8 inch open end and 6 inch adjustable wrenches.
- Remove preformed packing (3) from special elbow (2). Discard preformed packing.
- Plug adapter, and cap special elbow.



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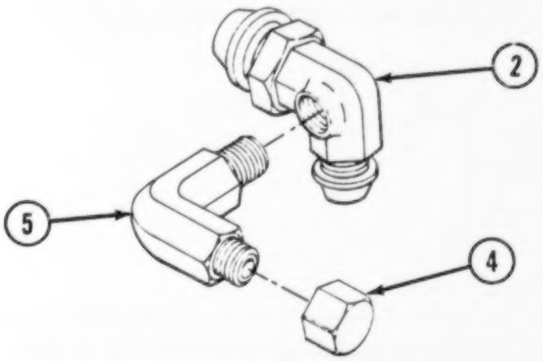
- Remove tube cap (4) from elbow (5). Use 9/16 inch open end and 6 inch adjustable wrenches.
- Plug tube cap, and cap elbow.
- Remove elbow (5) from special elbow (2). Use two 6 inch adjustable wrenches.
- Plug special elbow, and cap elbow.



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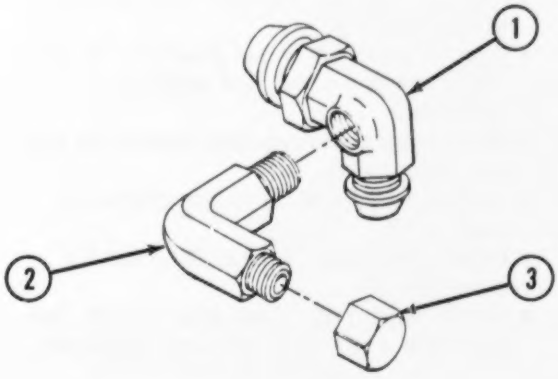
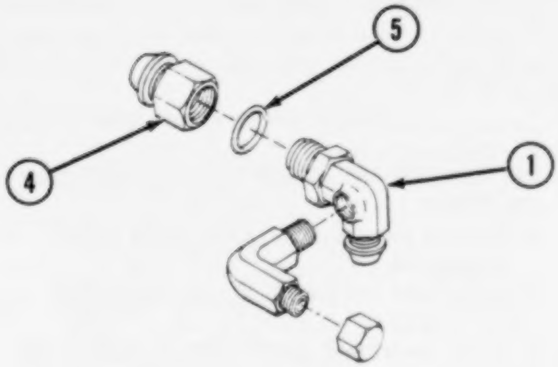
### K. SPECIAL PUMP ELBOW ASSEMBLY REASSEMBLY

REASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY.

- Remove plug and cap from special elbow (1) and elbow (2).
- Apply sealing compound to threads of elbow (2).
- Install elbow (2) on special elbow (1). Use two 6 inch adjustable wrenches.
- Remove plug and cap from tube cap (3) and elbow (2).
- Apply sealing compound to threads of elbow (2).
- Install tube cap (3) on elbow (2). Use 9/16 inch open end and 6 inch adjustable wrenches.



- Remove plug and cap from adapter (4) and special elbow (1).
- Apply light coat of oil to new preformed packing (5).
- Install preformed packing (5) on special elbow (1).
- Install adapter (4) on special elbow (1). Use 1 1/8 inch open end and 6 inch adjustable wrenches.



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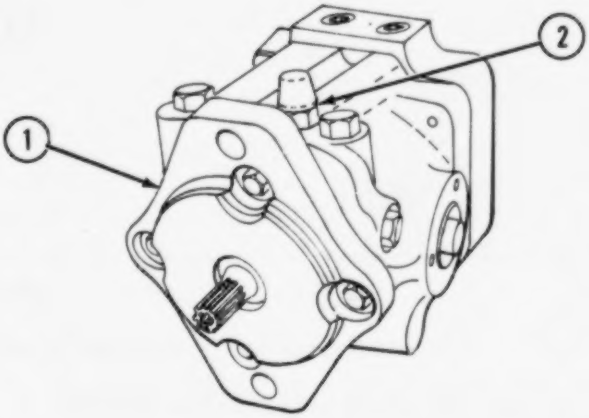
## L. PUMP ASSEMBLY INSTALLATION

NOTE

If servo filter feed adapter was not removed, go to step 2.

1. INSTALL SERVO FILTER FEED ADAPTER ON PUMP.
   - Remove plug and cap from pump (1) and adapter (2).
   - Apply sealing compound to threads of adapter (2).
   - Install adapter (2) on pump (1). Use 5/8 inch socket with ratchet handle.



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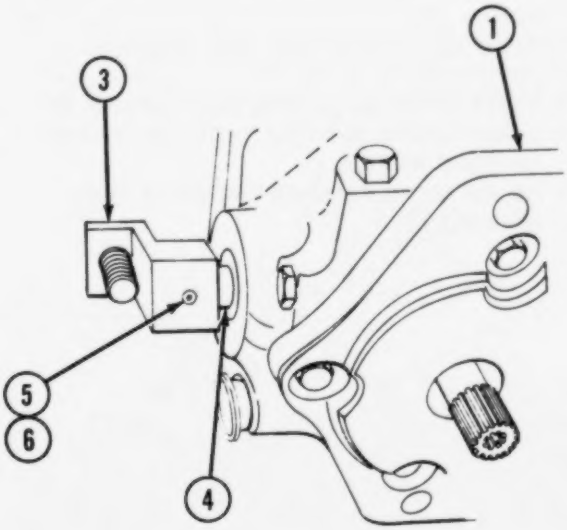
NOTE

If arm assembly was not removed, go to step 3.

2. INSTALL ARM ASSEMBLY ON TRUNNION SHAFT.
   - Place arm assembly (3), with flats to rear of pump (1), on trunnion shaft (4).
   - Aline spring pin mounting holes (5) in arm assembly (3) and trunnion shaft (4).
   - Install new spring pin (6) in arm assembly (3) and trunnion shaft (4). Use ball peen hammer.



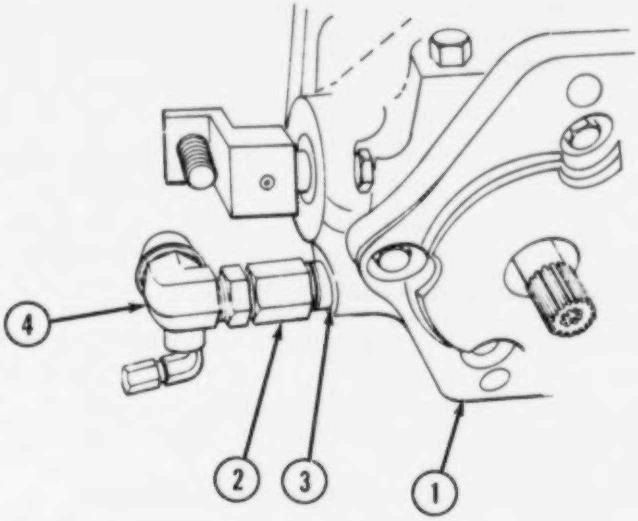
GO TO NEXT PAGE

## L. PUMP ASSEMBLY INSTALLATION — Continued

**NOTE**

If special pump elbow assembly was not removed, go to step 4.

3. INSTALL SPECIAL PUMP ELBOW ASSEMBLY ON PUMP.
   - Remove plug and cap from pump (1) and adapter (2).
   - Apply light coat of oil to new preformed packing (3).
   - Install preformed packing (3) on adapter (2).
   - Install adapter (2) with elbow assembly (4) on pump (1). Use 1 1/8 inch open end wrench.



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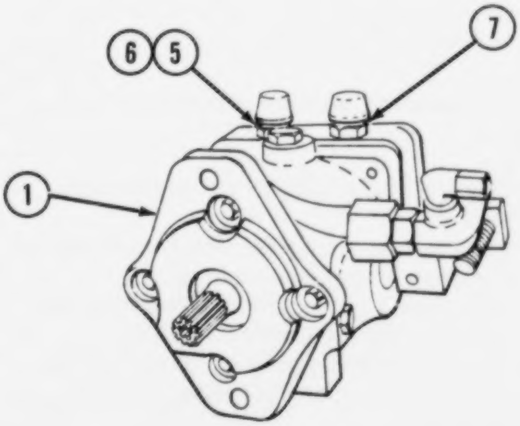
**NOTE**

If feed line pump adapters were not removed, go to step 5.

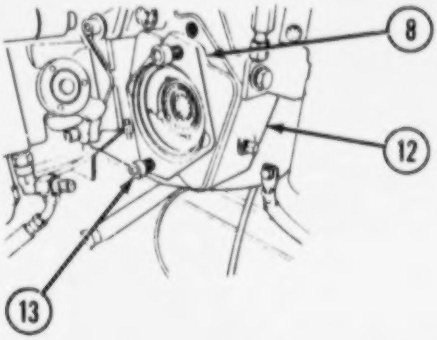
4. INSTALL TWO FEED LINE PUMP ADAPTERS ON PUMP.
   - Remove plug and cap from pump (1) and adapter (5).
   - Apply light coat of oil to new preformed packing (6).
   - Install preformed packing (6) on adapter (5).
   - Install adapter (5) on pump (1). Use 7/8 inch open end wrench.
   - Repeat above installation steps for other adapter (7).

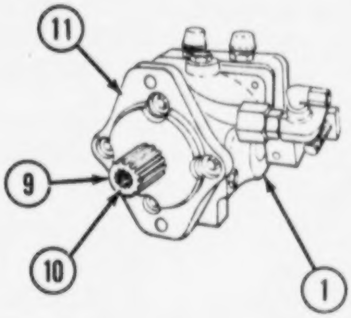


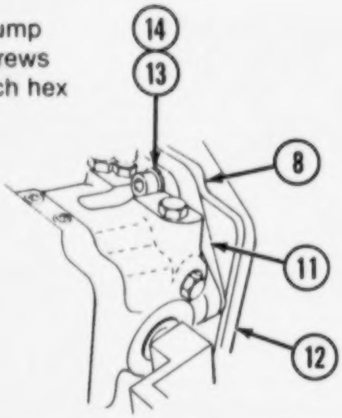
**CAUTION**

Pump adapter can fall and damage parts when pump is being installed on pump drive assembly. Hold adapter in place on pump drive assembly during pump installation.

5. INSTALL LEFT MAGAZINE PUMP ON PUMP DRIVE ASSEMBLY.
   - Remove plastic sheet and masking tape from adapter plate (8).
   - Apply light coat of sealing compound to gasket mating surfaces of pump (1) and adapter plate (8).
   - Install splined adapter (9) on pump shaft (10).
   - Position new gasket (11) on pump (1), with mounting holes alined.
   - Have helper hold adapter plate (8) in place on drive assembly (12) until pump (1) is installed. Remove two screws (13) from adapter plate and drive assembly. Use 3/8 inch hex key.
   - Install adapter plate (8), gasket (11), pump (1), two new lock washers (14), and screws (13) on drive assembly (12). Use 3/8 inch hex key. Use helper.







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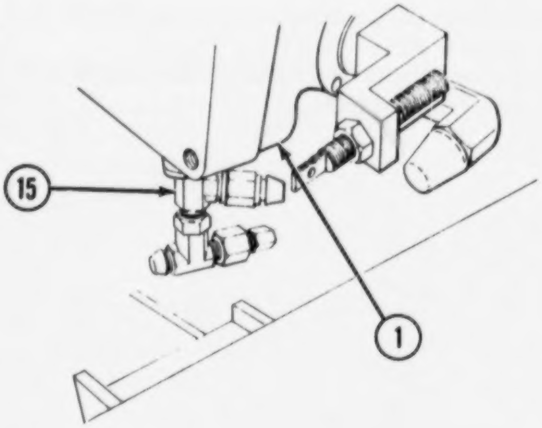
6. INSTALL TEE ASSEMBLY ON PUMP.
   - Remove plug and cap from pump (1) and tee assembly (15).
   - Apply sealing compound to threads of tee assembly (15).
   - Install tee assembly (15) on pump (1). Use 1 1/8 inch open end wrench.



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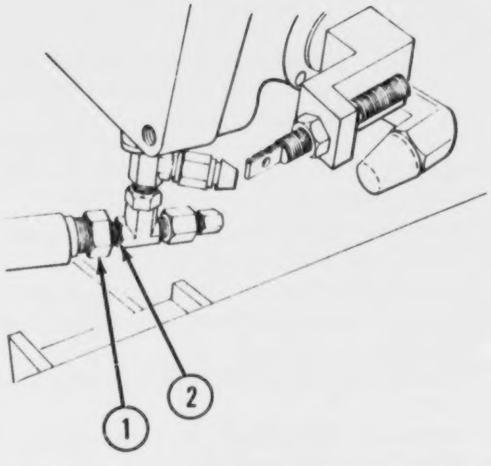
## L. PUMP ASSEMBLY INSTALLATION — Continued

7. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO TEE ASSEMBLY REDUCER.
   - Remove plug and cap from hose (1) and reducer (2).
   - Connect hose (1) to reducer (2). Use 1 1/16 inch open end wrench.



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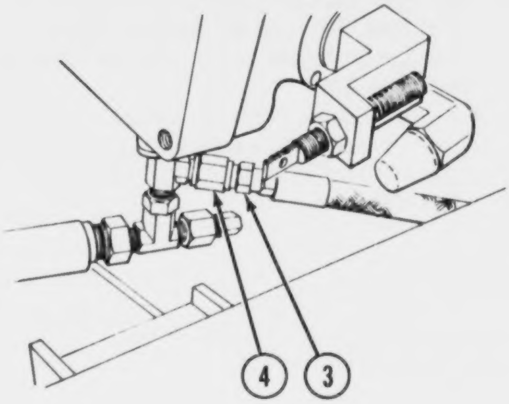
8. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO TEE ASSEMBLY REDUCER.
   - Remove plug and cap from hose (3) and reducer (4).
   - Connect hose (3) to reducer (4). Use 11/16 inch open end wrench.



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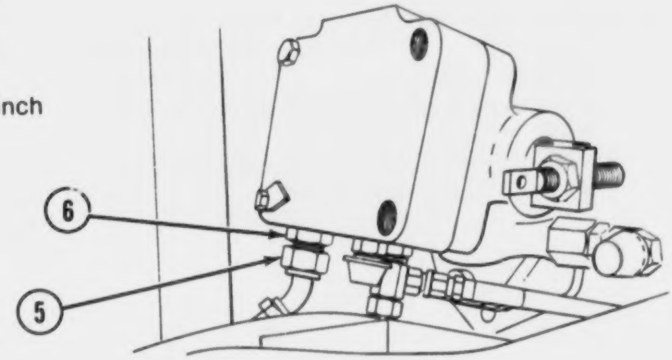
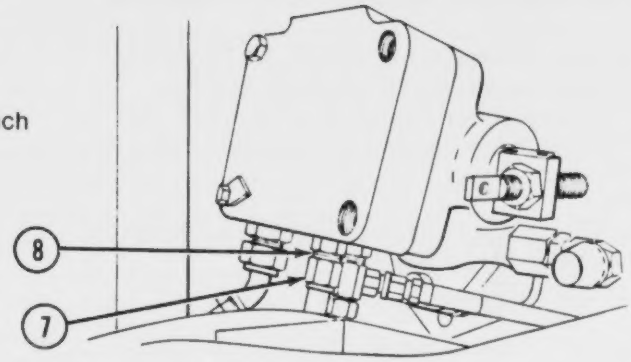
9. CONNECT FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (5) and adapter (6).
   - Connect hose (5) to adapter (6). Use 7/8 inch open end wrench.



10. CONNECT FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (7) and adapter (8).
    - Connect hose (7) to adapter (8). Use 7/8 inch open end wrench.



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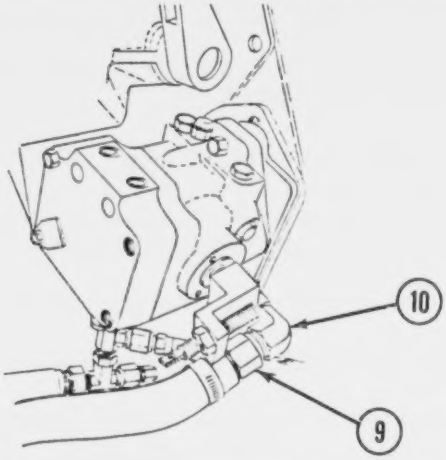
11. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW ASSEMBLY.
    - Remove plug and cap from hose (9) and elbow assembly (10).
    - Connect hose (9) to elbow assembly (10). Use 1 1/4 inch open end wrench.



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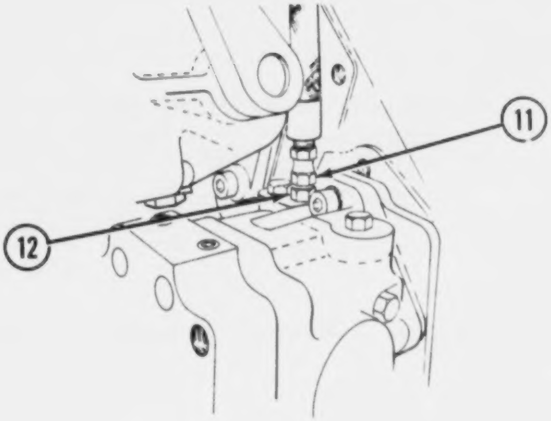
12. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (11) and adapter (12).
    - Connect hose (11) to adapter (12). Use 11/16 inch open end wrench.



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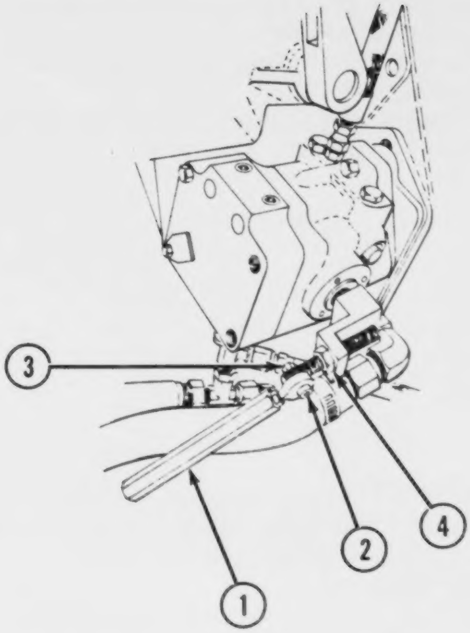
## L. PUMP ASSEMBLY INSTALLATION — Continued

13. INSTALL TURNBUCKLE ON ADJUSTING ROD.
    - Install turnbuckle (1), screw (2), and new self-locking nut (3) on adjusting rod (4). Use 5/32 inch hex key and 7/16 inch box end wrench.



14. INSTALL MAIN CONTROL PANEL MOUNTING BRACKET ON DISPENSER. (SEE TM 9-1095-205-20.)
15. INSTALL MAIN CONTROL PANEL ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)
16. INSTALL SERVO ACTUATOR ON LEFT MAGAZINE PUMP ASSEMBLY. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-312.)
17. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)
18. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)
19. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)
20. PLACE HYDRAULIC SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)
21. STOP ENGINE. (SEE TM 9-1095-205-20.)
22. PERFORM SERVO ACTUATOR OPERATIONAL CHECK. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-315.)
23. ADJUST LEFT MAGAZINE PUMP LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-25 LEFT MAGAZINE PUMP LINES

### DESCRIPTION

This task covers:
A. SERVO FILTER FEED HOSE ASSEMBLY REMOVAL (p 15-338)
B. SERVO FILTER FEED HOSE ASSEMBLY INSTALLATION (p 15-339)
C. SERVO ACTUATOR DRAIN HOSE ASSEMBLY REMOVAL (p 15-340)
D. SERVO ACTUATOR DRAIN HOSE ASSEMBLY INSTALLATION (p 15-341)
E. MAGAZINE PUMP SUCTION HOSE ASSEMBLY REMOVAL (p 15-342)
F. MAGAZINE PUMP SUCTION HOSE ASSEMBLY INSTALLATION (p 15-342)
G. FEED LINE A HOSE ASSEMBLY REMOVAL (p 15-343)
H. FEED LINE A HOSE ASSEMBLY INSTALLATION (p 15-344)
I. FEED LINE B HOSE ASSEMBLY REMOVAL (p 15-345)
J. FEED LINE B HOSE ASSEMBLY INSTALLATION (p 15-346)
K. MAGAZINE PUMP DRAIN HOSE ASSEMBLY REMOVAL (p 15-347)
L. MAGAZINE PUMP DRAIN HOSE ASSEMBLY INSTALLATION (p 15-348)
M. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY REMOVAL (p 15-349)
N. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY INSTALLATION (p 15-350)

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### INITIAL SETUP

*Tools and Special Tools:*
General mechanic's tool kit
5180-00-177-7033:
7/8 inch open end wrench
11/16 inch open end wrench
1 1/16 inch open end wrench 5120-00-187-7134

*Tools and Special Tools: (Continued)*
1 1/4 inch open end wrench 5120-00-187-7134
Cap and plug set 5340-00-450-5718

*References:*
TM 9-1095-205-10
TM 9-1095-205-20

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

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### OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

Tubes and hoses are not supplied as parts. If you need a new hose, see Appendix C and make one. See:

| | |
|---|---|
| 9291098 | feed line B hose assembly. |
| 9291099 | feed line A hose assembly. |

[illegible] you remove more than one hose assembly, tag and mark each one. Remove tags after hose assembly installation.

GO TO NEXT PAGE

## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### A. SERVO FILTER FEED HOSE ASSEMBLY REMOVAL

**NOTE**

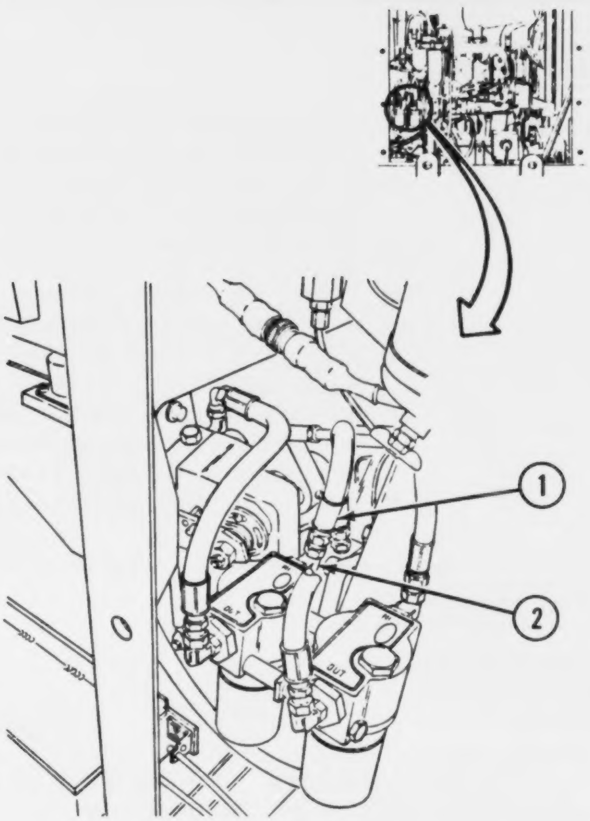
***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)

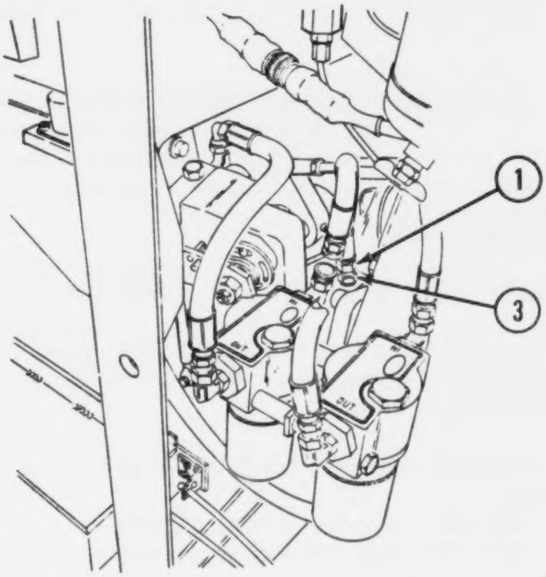
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)

Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM FILTER TEE.
    - Disconnect hose (1) from tee (2). Use 11/16 inch open end wrench.
    - Plug hose, and cap tee.

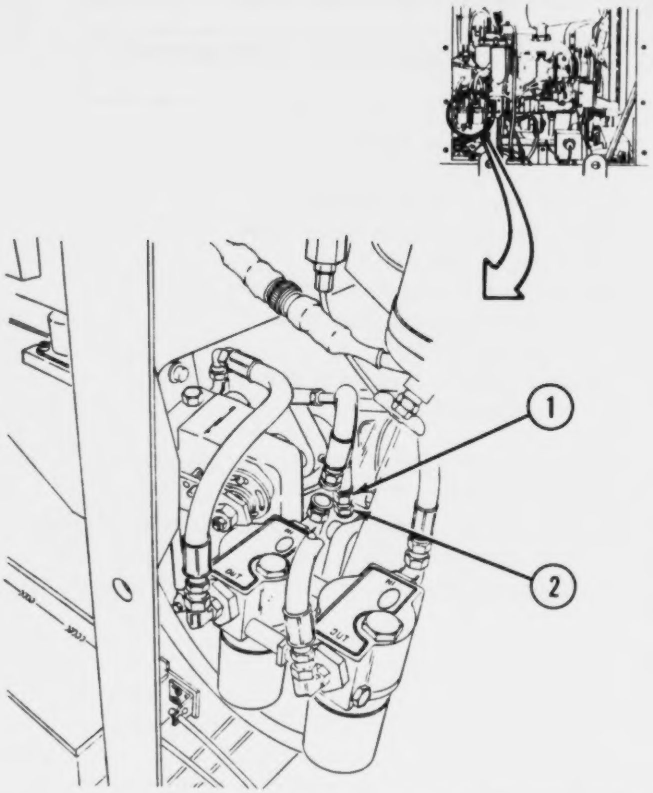


2. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM PUMP ADAPTER.
    - Disconnect hose (1) from adapter (3). Use 11/16 inch open end wrench.
    - Plug hose, and cap adapter.
    - Remove hose (1) from dispenser.



## B. SERVO FILTER FEED HOSE ASSEMBLY INSTALLATION

1. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 11/16 inch open end wrench.



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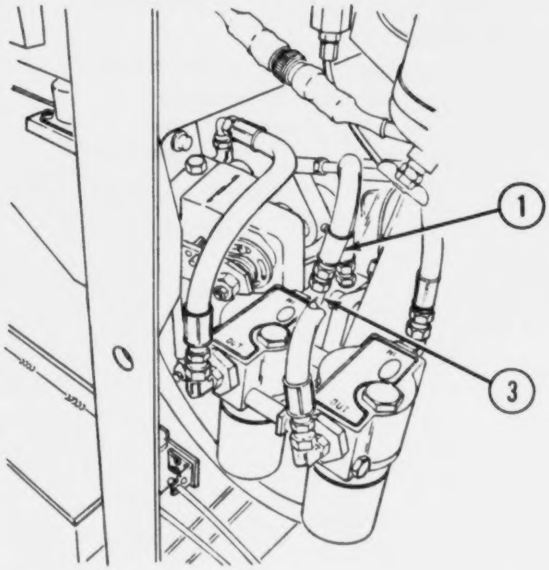
2. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO FILTER TEE.
   - Remove plug and cap from hose (1) and tee (3).
   - Connect hose (1) to tee (3). Use 11/16 inch open end wrench.



**NOTE**

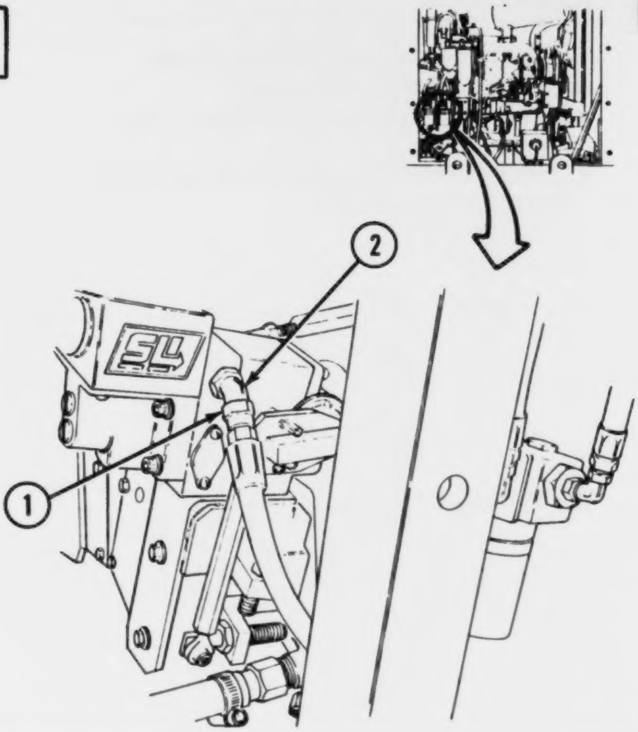
***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### C. SERVO ACTUATOR DRAIN HOSE ASSEMBLY REMOVAL



**NOTE**

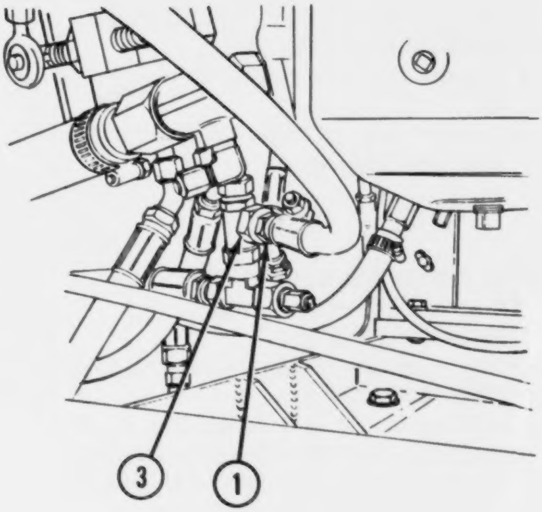
***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM SERVO ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.

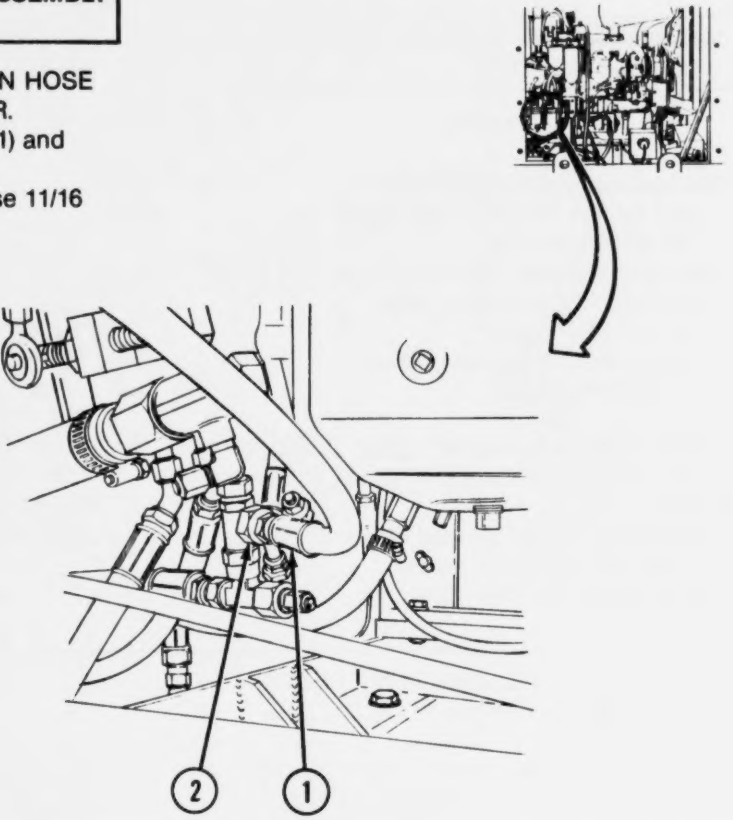
---

2. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM PUMP TEE REDUCER.
   - Disconnect hose (1) from reducer (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap reducer.
   - Remove hose (1) from dispenser.



## D. SERVO ACTUATOR DRAIN HOSE ASSEMBLY INSTALLATION

1. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO PUMP TEE REDUCER.
   - Remove plug and cap from hose (1) and reducer (2).
   - Connect hose (1) to reducer (2). Use 11/16 inch open end wrench.



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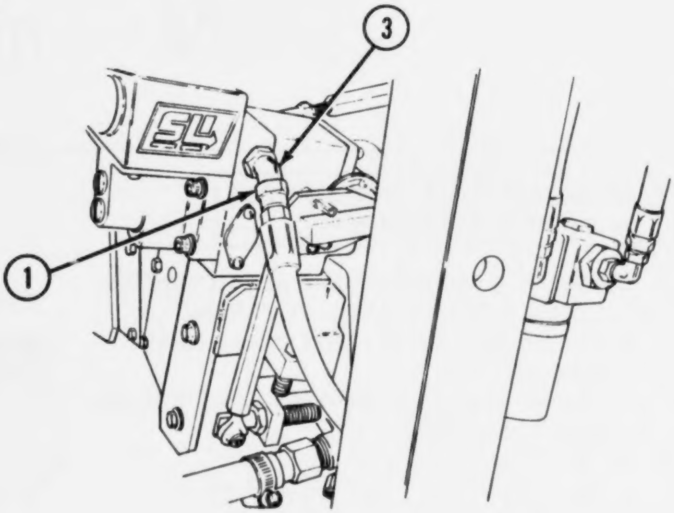
2. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO SERVO ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

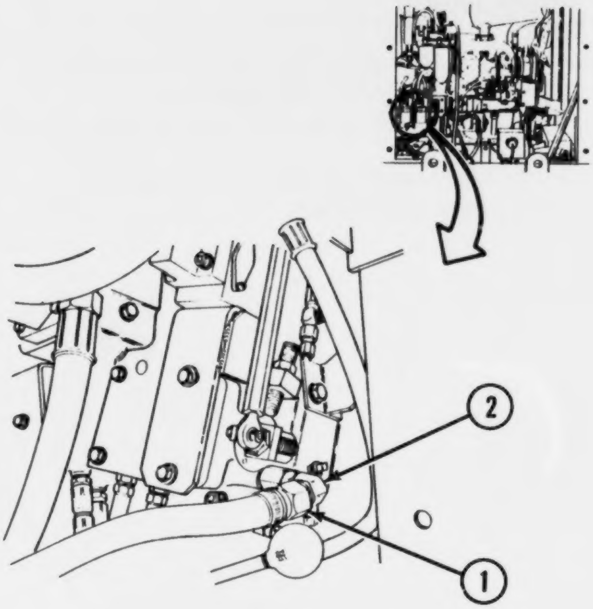
## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### E. MAGAZINE PUMP SUCTION HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

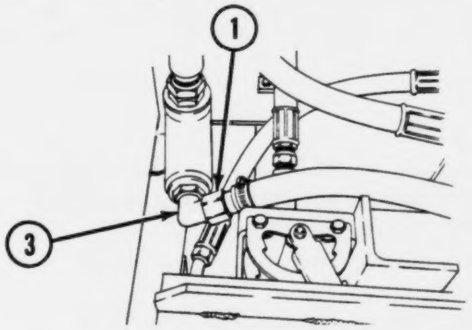
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)



1. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW.
   - Disconnect hose (1) from elbow (2). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap elbow.

---

2. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SUCTION LINE ELBOW.
   - Disconnect hose (1) from elbow (3). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap elbow.
   - Remove hose (1) from dispenser.



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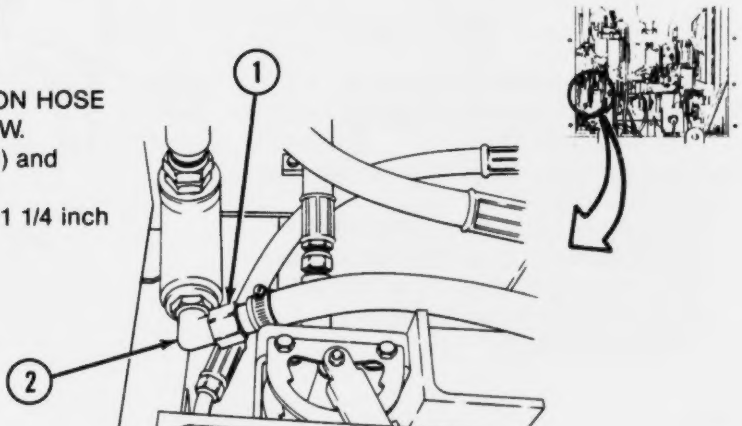
### F. MAGAZINE PUMP SUCTION HOSE ASSEMBLY INSTALLATION

1. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SUCTION LINE ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 1 1/4 inch open end wrench.

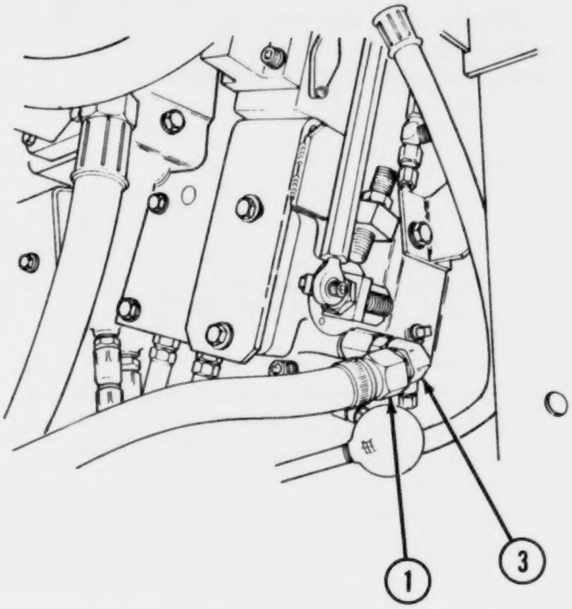


2. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 1 1/4 inch open end wrench.

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



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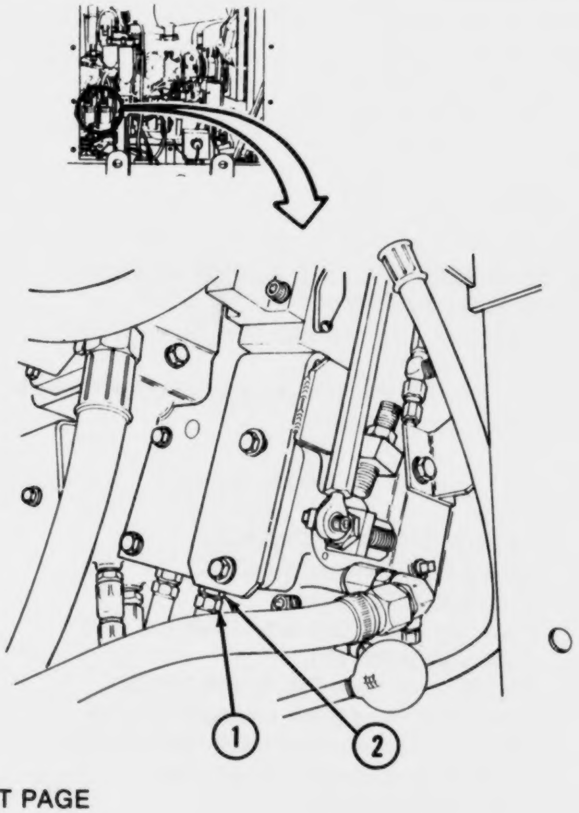
## G. FEED LINE A HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



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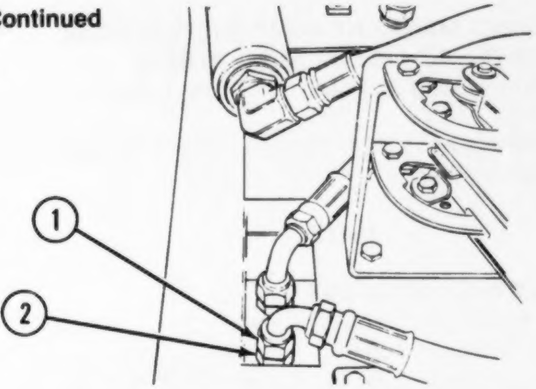
### G. FEED LINE A HOSE ASSEMBLY REMOVAL — Continued

2. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM BYPASS VALVE ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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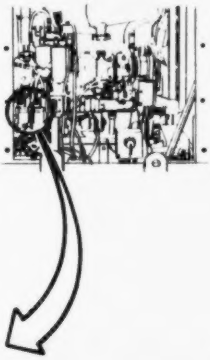
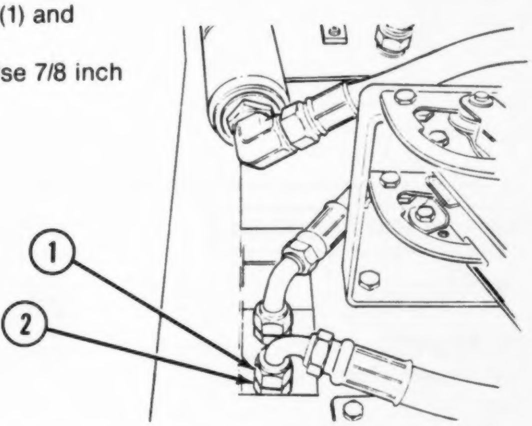
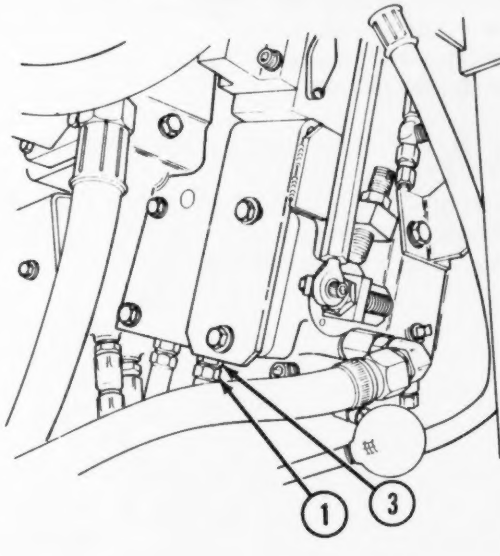
### H. FEED LINE A HOSE ASSEMBLY INSTALLATION

1. CONNECT FEED LINE A HOSE ASSEMBLY TO BYPASS VALVE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 7/8 inch open end wrench.





2. CONNECT FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (3).
   - Connect hose (1) to adapter (3). Use 7/8 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

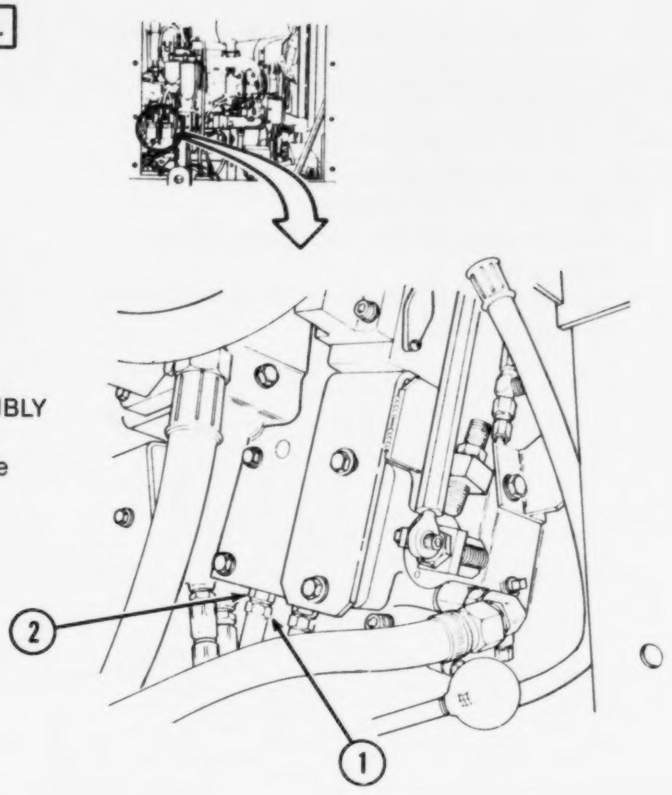
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## I. FEED LINE B HOSE ASSEMBLY REMOVAL

NOTE

***PRELIMINARY PROCEDURES:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



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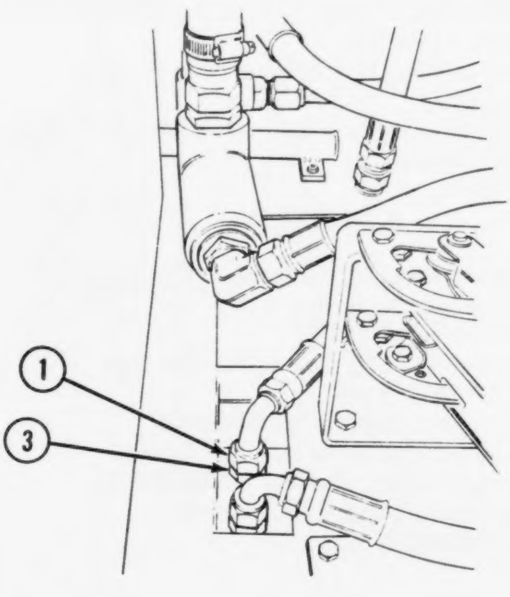
2. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM BYPASS VALVE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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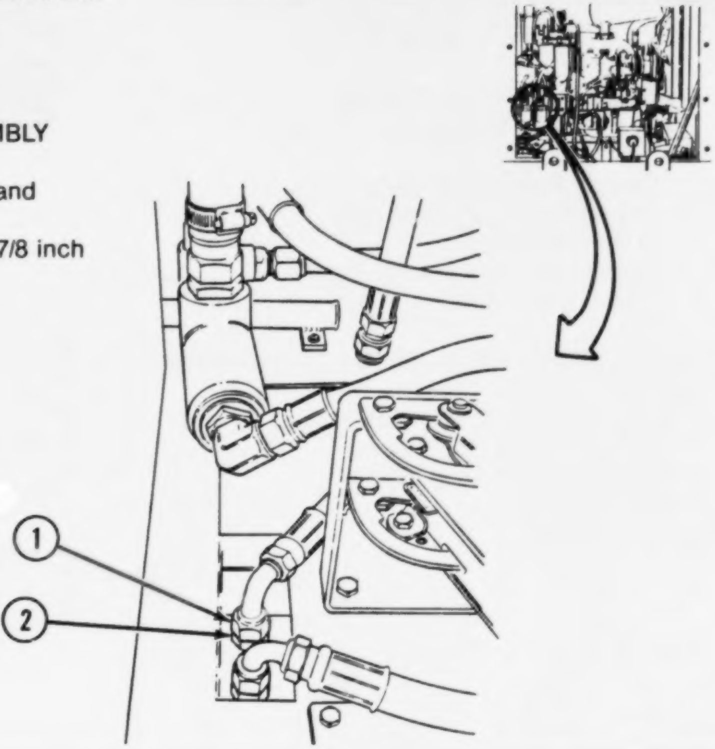
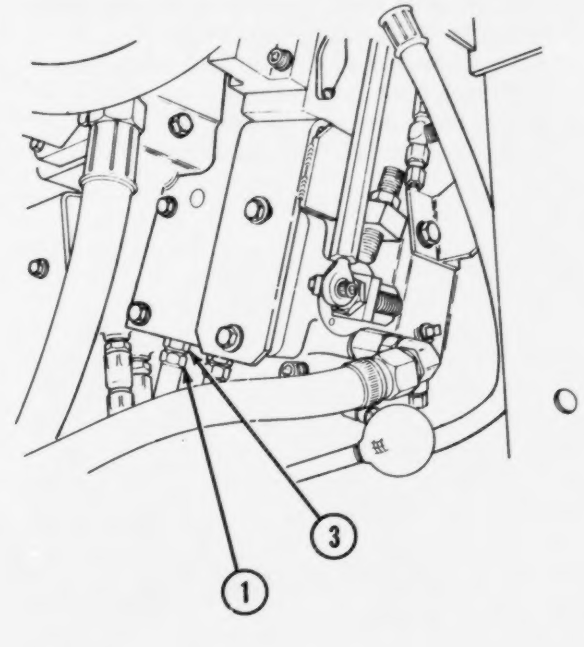
## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### J. FEED LINE B HOSE ASSEMBLY INSTALLATION



1. CONNECT FEED LINE B HOSE ASSEMBLY TO BYPASS VALVE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 7/8 inch open end wrench.



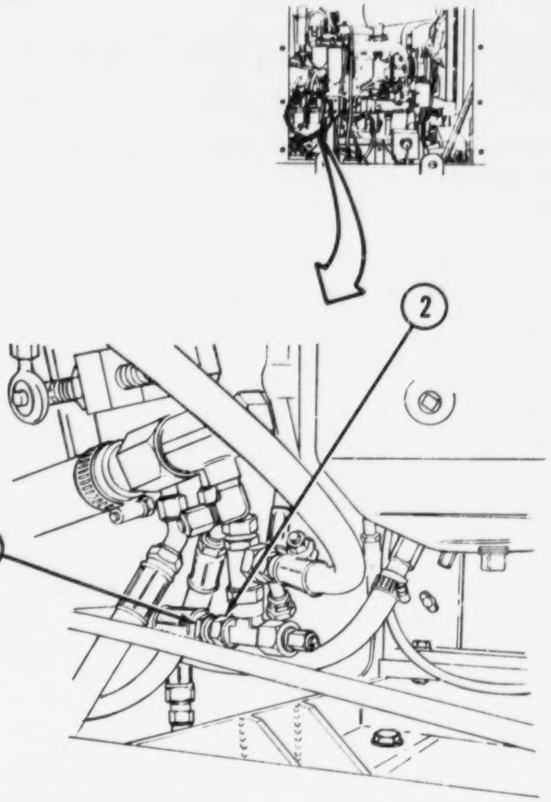
2. CONNECT FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (3).
   - Connect hose (1) to adapter (3). Use 7/8 inch open end wrench.

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## K. MAGAZINE PUMP DRAIN HOSE ASSEMBLY REMOVAL



### NOTE

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)

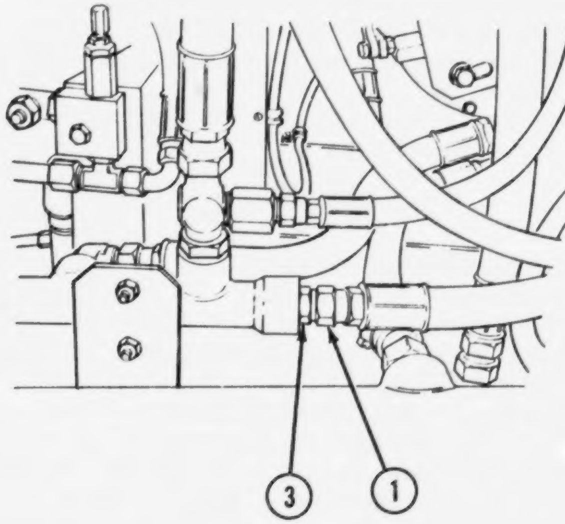
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)

Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM PUMP TEE REDUCER.
   - Remove hose (1) from reducer (2). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap reducer.

---

2. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM DRAIN LINE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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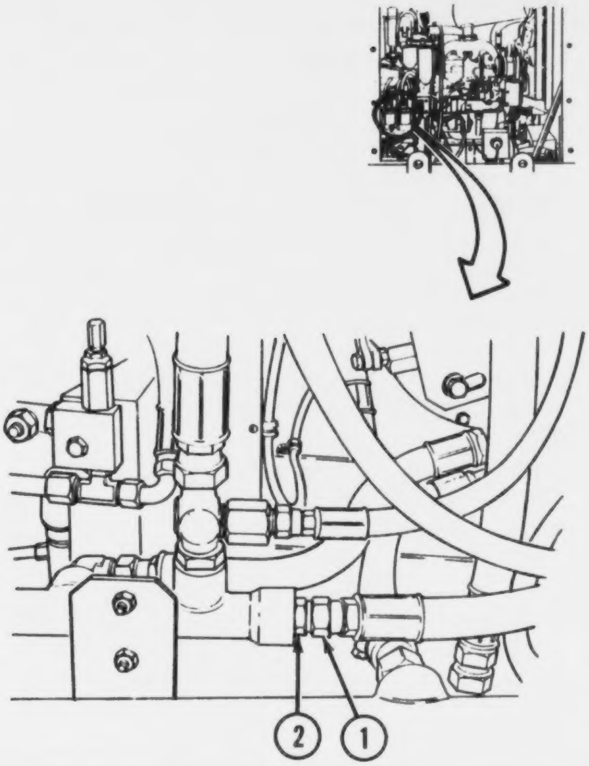
## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### L. MAGAZINE PUMP DRAIN HOSE ASSEMBLY INSTALLATION

1. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO DRAIN LINE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 1 1/16 inch open end wrench.



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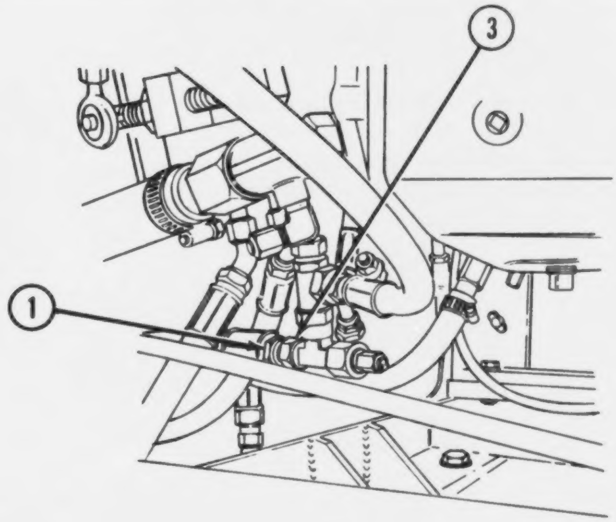
2. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO PUMP TEE REDUCER.
   - Remove plug and cap from hose (1) and reducer (3).
   - Connect hose (1) to reducer (3). Use 1 1/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

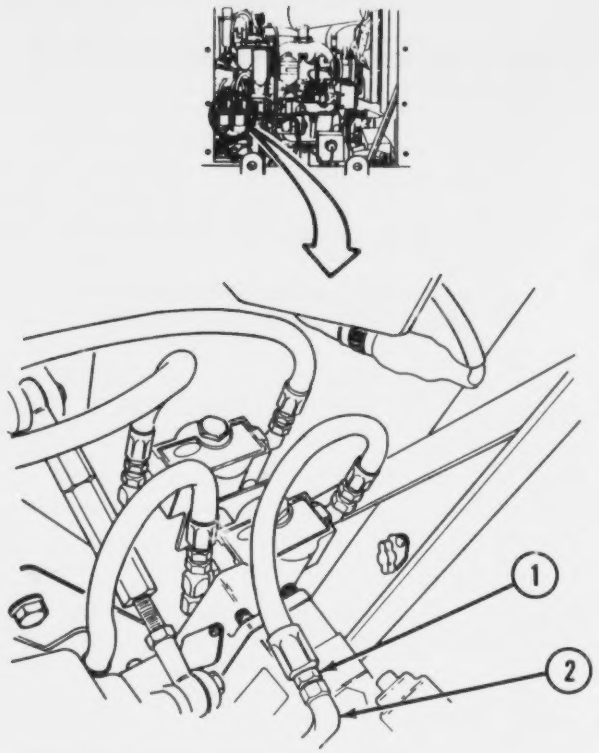
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## M. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM SERVO ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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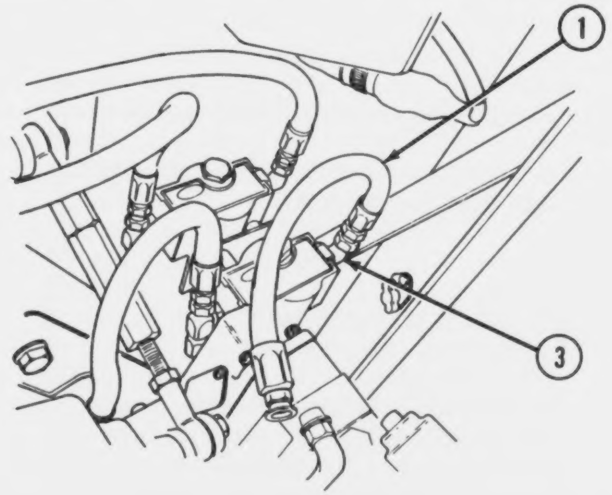
2. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM FILTER ELBOW.
   - Disconnect hose (1) from elbow (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.
   - Remove hose (1) from dispenser.



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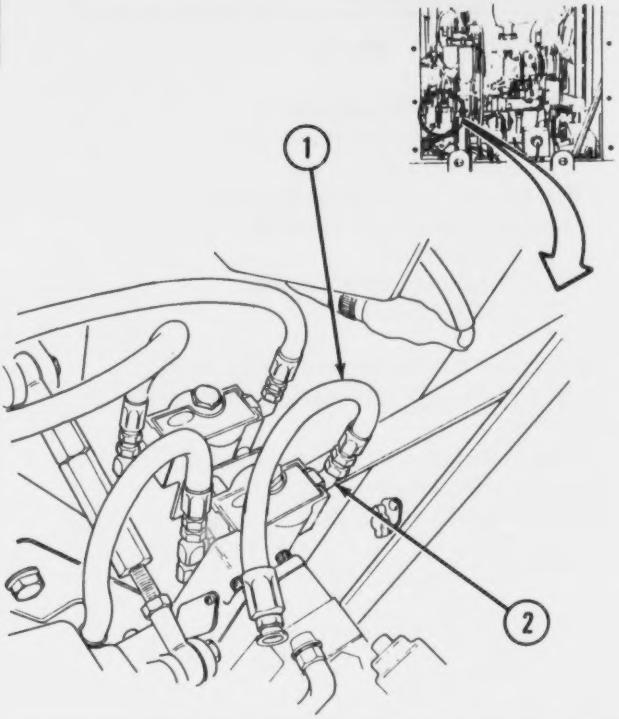
## 15-25 LEFT MAGAZINE PUMP LINES — Continued

### N. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY INSTALLATION

1. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO FILTER ELBOW.
   - Remove plug and cap from hose (1) and elbow (2).
   - Connect hose (1) to elbow (2). Use 11/16 inch open end wrench.



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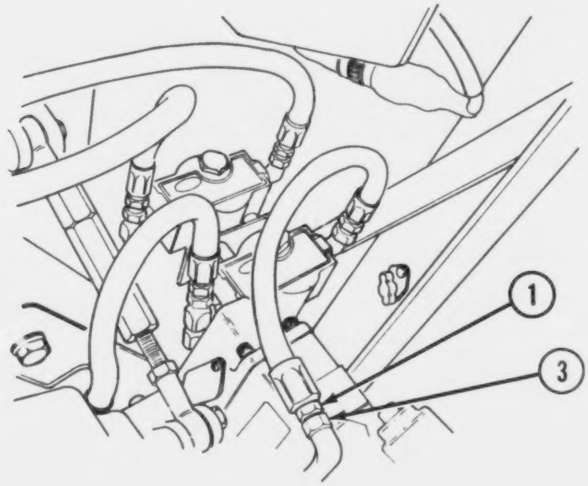
2. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO SERVO ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-26 RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR

### DESCRIPTION

This task covers:

A. SERVO ACTUATOR REMOVAL (p 15-352)
B. SERVO ACTUATOR INSTALLATION (p 15-356)
C. SERVO ACTUATOR OPERATIONAL CHECK (p 15-359)
D. SERVO ACTUATOR BACK PLATE ADJUSTMENT (p 15-364)
E. PUMP ASSEMBLY REMOVAL (p 15-365)
F. INPUT AND TRUNNION SHAFTS LIP SEALS REMOVAL (p 15-371)
G. INPUT AND TRUNNION SHAFTS LIP SEALS INSTALLATION (p 15-372)
H. TEE ASSEMBLY DISASSEMBLY (p 15-373)
I. TEE ASSEMBLY REASSEMBLY (p 15-374)
J. SPECIAL PUMP ELBOW ASSEMBLY DISASSEMBLY (p 15-374)
K. SPECIAL PUMP ELBOW ASSEMBLY REASSEMBLY (p 15-375)
L. PUMP ASSEMBLY INSTALLATION (p 15-376)

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### INITIAL SETUP

***Tools and Special Tools:***

- General mechanic's tool kit
  5180-00-177-7033:
    - Thickness gage
    - Ball peen hammer
    - 5/32 inch hex key
    - Putty knife
    - Center punch
    - 6 inch steel rule
    - 5/16 inch flat tip screwdriver
    - 7/16 inch socket
    - 3/8 inch flat tip screwdriver
    - 1/4 inch flat tip screwdriver
    - 9/16 inch socket
    - 5/8 inch socket
    - Ratchet handle
    - 6 inch adjustable wrench (2)
    - 9/16 inch open end wrench
    - 11/16 inch open end wrench
    - 3/4 inch open end wrench
    - 7/8 inch open end wrench
    - 1 inch open end wrench
    - 7/16 inch box end wrench
    - 9/16 inch box end wrench
- 3/8 inch hex key 5120-00-935-4641
- 3/16 inch pin punch 5120-00-293-0791
- 1 1/16 inch open end wrench 5120-00-187-7134
- 1 1/8 inch open end wrench 5120-00-277-2694

***Tools and Special Tools — Continued:***

- 1 1/4 inch open end wrench 5120-00-187-7134
- Machinist's rule 5120-00-234-5223
- Funnel 7240-00-559-7364
- Drain pan 9410-00-387-9592
- Cap and plug set 5340-00-450-5718
- Suitable hose
- Mandrel (2)

***Materials/Parts:***

- Preformed packing (2) 5330-00-804-5695
- Self-locking nut (2) 5310-00-088-1251
- Self-locking screw (2) 5306-01-163-2429
- Self-locking screw (4) (96906) MS18154-6L
- Lock washer (2) 5310-00-637-9541
- Gasket 5330-01-112-1581
- Preformed packing (3) 5330-00-006-2249
- Spring pin 5315-00-844-5836
- Seal kit 1095-01-152-9896
- Preformed packing 5330-00-932-6748
- Sealing compound, Item 26, Appendix B
- Lubricating oil (see LO 9-1095-205-12), Item 16, Appendix B
- Solvent, Item 28, Appendix B
- Crocus cloth, Item 4, Appendix B
- Plastic sheet, Item 20, Appendix B
- Masking tape, Item 19, Appendix B
- Rags, Item 22, Appendix B

GO TO NEXT PAGE

**INITIAL SETUP — Continued**

***Personnel Required:***

Mechanic
Helper

***References:***

TM 9-1095-205-10
TM 9-1095-205-20
MAGAZINE PUMPS LINKAGE ADJUSTMENT, Page 15-401

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

## OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

Seal fluid line fittings. Nonflared fittings, or fittings without seal, gasket, preformed packing, or other sealing hardware, need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

If you disconnect more than one hose assembly, tag and mark each one. Remove tags after connecting hose assemblies.

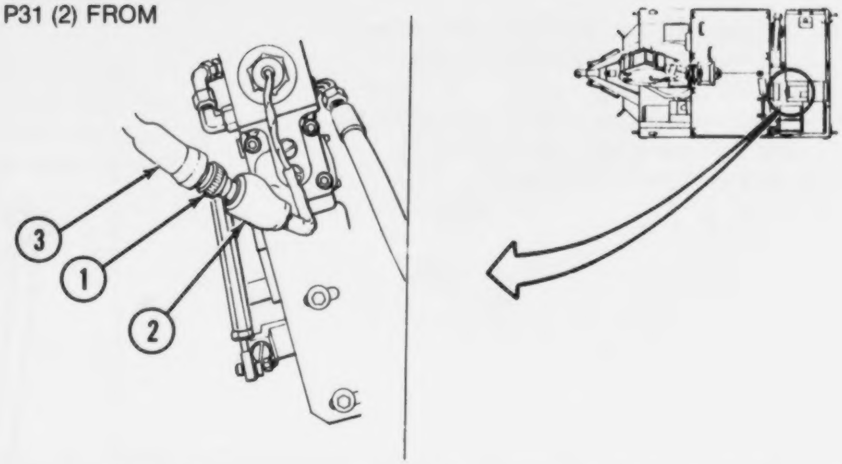
## A. SERVO ACTUATOR REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. TURN CONNECTOR SLEEVE (1), AND DISCONNECT CONNECTOR P31 (2) FROM RECEPTACLE J31 (3).



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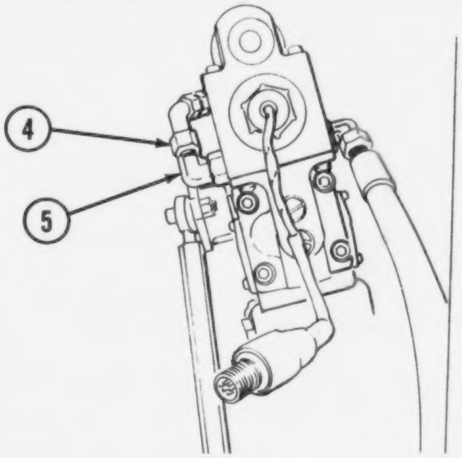
**NOTE**

Push lever arm down if necessary for hose assembly removal clearance.

2. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM DRAIN ELBOW.
   - Disconnect hose (4) from elbow (5). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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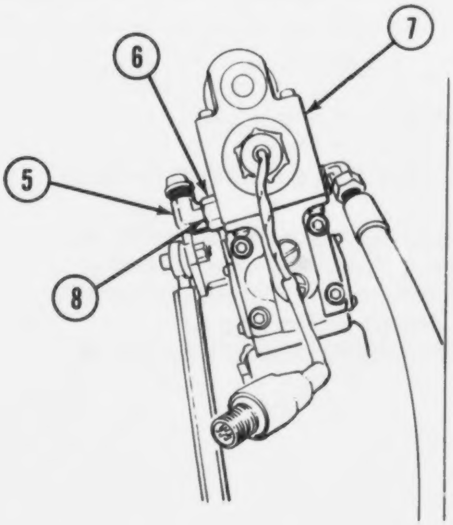
**NOTE**

Do not remove drain elbow unless required for maintenance.

3. REMOVE DRAIN ELBOW FROM SERVO ACTUATOR.
   - Loosen nut (6) on elbow (5). Use 11/16 inch open end wrench.
   - Remove elbow (5) from servo actuator (7). Use 6 inch adjustable wrench. Plug servo actuator.
   - Remove preformed packing (8) from elbow (5). Discard preformed packing. Cap elbow.



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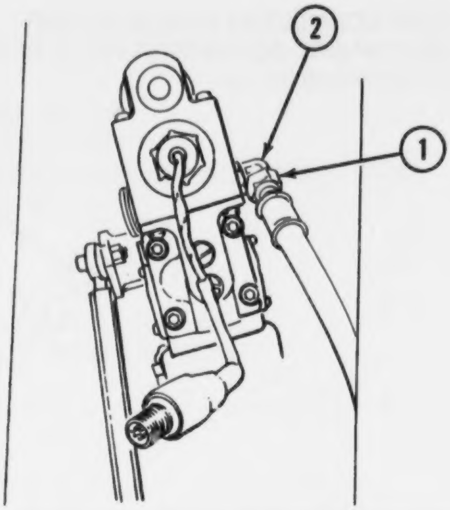
## A. SERVO ACTUATOR REMOVAL — Continued

4. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM CONTROL ELBOW.
   - Disconnect hose (1) from elbow (2). Use 3/4 inch open end wrench.
   - Plug hose, and cap elbow.



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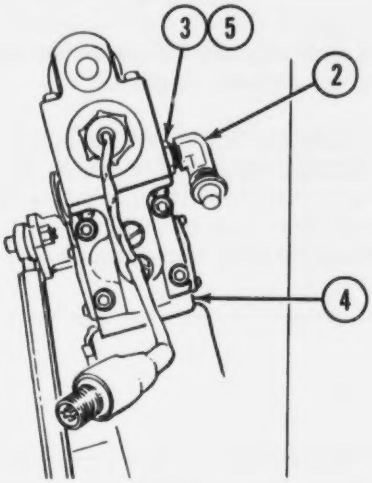
**NOTE**

Do not remove control elbow unless required for maintenance.

5. REMOVE CONTROL ELBOW FROM SERVO ACTUATOR.
   - Loosen nut (3) on elbow (2). Use 11/16 inch open end wrench.
   - Remove elbow (2) from servo actuator (4). Use 6 inch adjustable wrench. Plug servo actuator.
   - Remove preformed packing (5) from elbow (2). Discard preformed packing.
   - Cap elbow.



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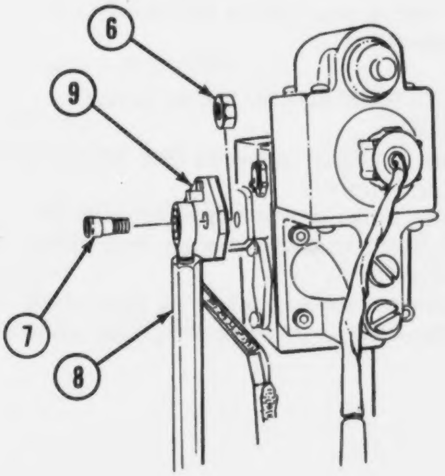
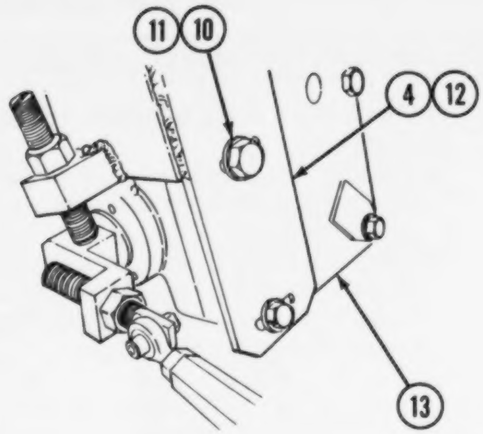
**NOTE**

Do not change turnbuckle length.

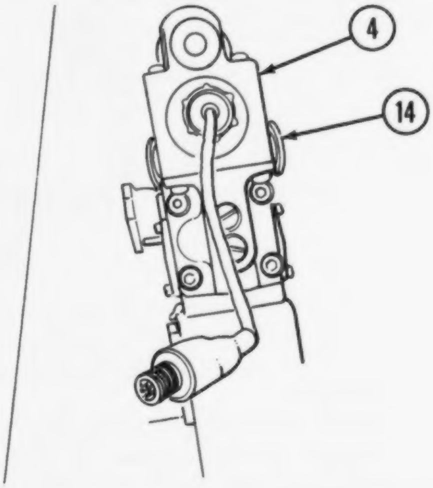
6. REMOVE TURNBUCKLE ROD END FROM DRIVE LEVER.
   - Remove self-locking nut (6), screw (7), and turnbuckle (8) from drive lever (9). Use 5/32 inch hex key and 7/16 inch box end wrench. Discard self-locking nut.
   - Move turnbuckle (8) clear of lever arm (9).



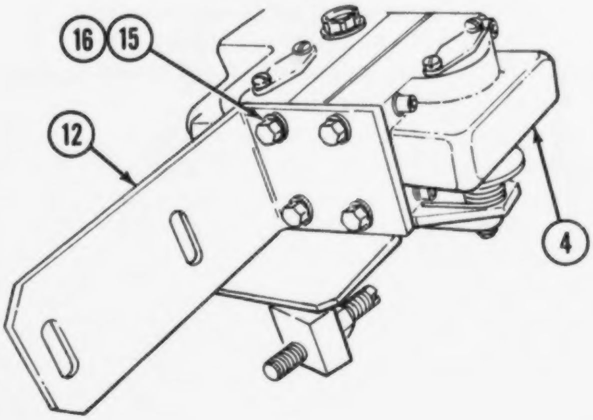
7. REMOVE MOUNTING BRACKET WITH SERVO ACTUATOR FROM RIGHT MAGAZINE PUMP ASSEMBLY.
   - Remove two self-locking screws (10), washers (11), and mounting bracket (12) with servo actuator (4) from pump (13). Use 9/16 inch socket with ratchet handle. Discard self-locking screws.



8. DRAIN OIL FROM SERVO ACTUATOR.
   - Remove plugs from two ports (14) on servo actuator (4).
   - Drain oil. Use drain pan.
   - Plug servo actuator.
   - Dispose of drained oil according to local procedures.



9. REMOVE MOUNTING BRACKET FROM SERVO ACTUATOR.
   - Remove four self-locking screws (15), washers (16), and mounting bracket (12) from servo actuator (4). Use 7/16 inch socket with ratchet handle. Discard self-locking screws.



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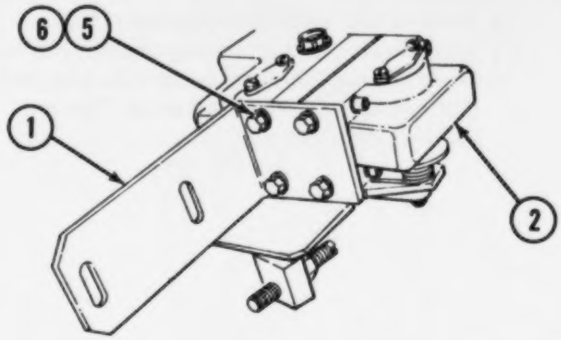
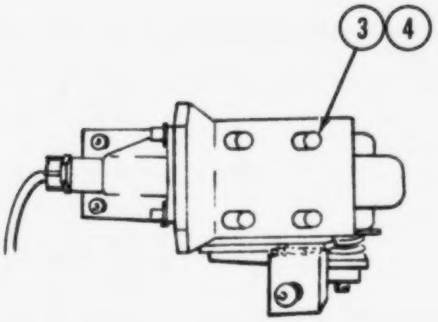
## 15-26 RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR — Continued

### B. SERVO ACTUATOR INSTALLATION

1. INSTALL MOUNTING BRACKET ON SERVO ACTUATOR.
    - Position mounting bracket (1) on servo actuator (2), with right end of four slots (3) and screw holes (4) alined.
    - Install mounting bracket (1), four washers (5), and new self-locking screws (6) on servo actuator (2). Use 7/16 inch socket with ratchet handle.





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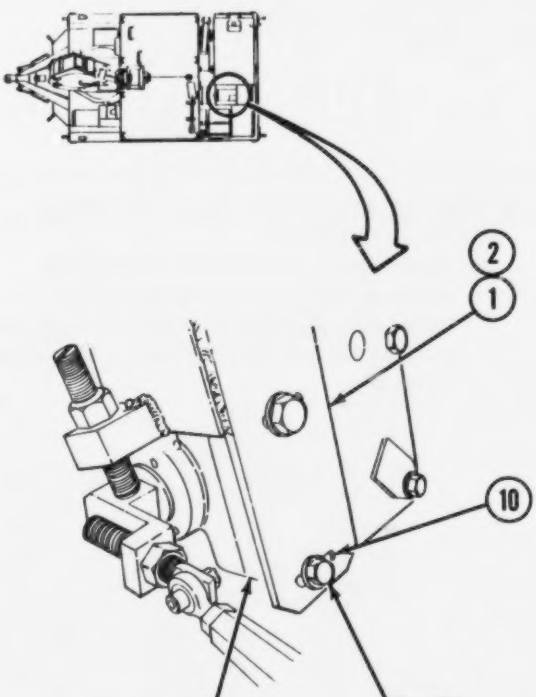
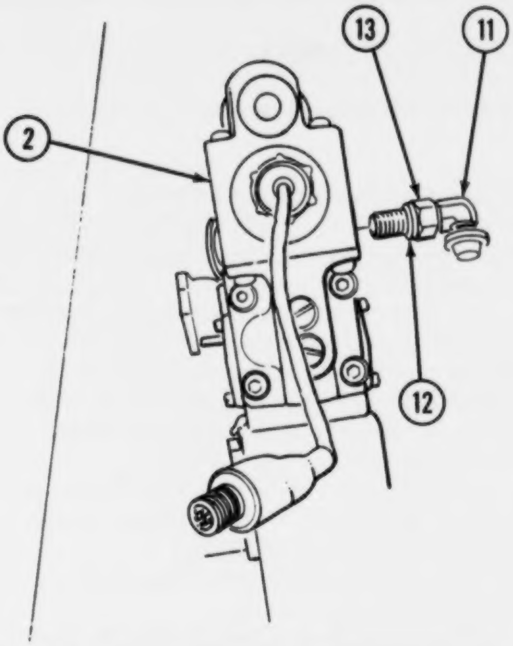
2. INSTALL MOUNTING BRACKET WITH SERVO ACTUATOR ON RIGHT MAGAZINE PUMP ASSEMBLY.
    - Install mounting bracket (1) with servo actuator (2), two washers (7), and new self-locking screws (8) on pump (9). Use 9/16 inch socket with ratchet handle. Do not tighten.
    - Position mounting bracket (1) with two screws (8) centered in two slots (10).
    - Tighten two screws (8). Use 9/16 inch socket with ratchet handle.



**NOTE**

If control elbow was not removed, go to step 4.

3. INSTALL CONTROL ELBOW ON SERVO ACTUATOR.
   - Remove plug and cap from servo actuator (2) and elbow (11).
   - Apply light coat of hydraulic fluid to new preformed packing.
   - Install preformed packing (12) on elbow (11).
   - Install elbow (11) on servo actuator (2) with elbow pointing down. Use 6 inch adjustable wrench. Do not tighten nut (13).



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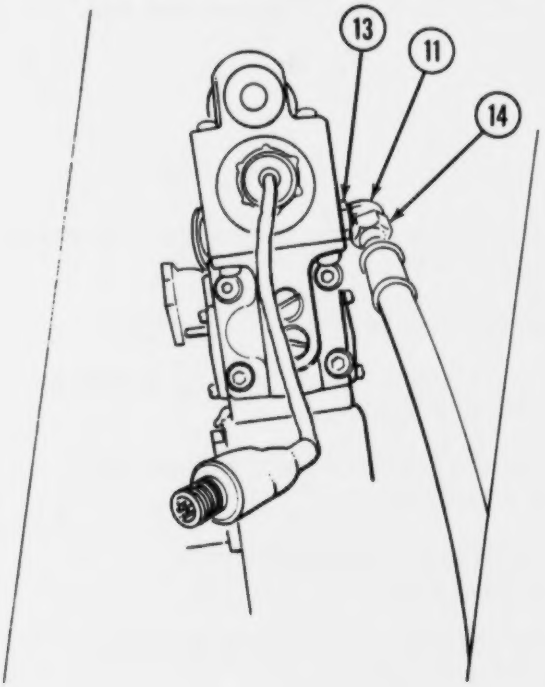
4. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO CONTROL ELBOW.
   - Remove plug and cap from hose (14) and elbow (11).
   - Connect hose (14) to elbow (11). Use 11/16 inch open end wrench.
   - Tighten nut (13). Use 11/16 inch open end wrench.



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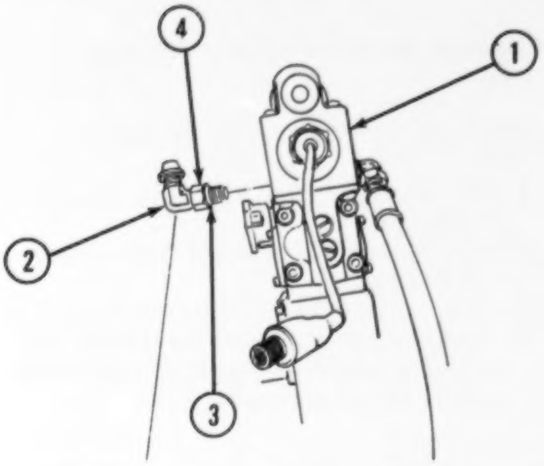
## B. SERVO ACTUATOR INSTALLATION — Continued

### NOTE

If drain elbow was not removed, go to step 6.

5. INSTALL DRAIN ELBOW ON SERVO ACTUATOR.
   - Remove plug and cap from servo actuator (1) and elbow (2).
   - Apply light coat of hydraulic fluid to new preformed packing (3).
   - Install preformed packing (3) on elbow (2).
   - Install elbow (2) on servo actuator (1), with elbow pointing up. Use 6 inch adjustable wrench. Do not tighten nut (4).



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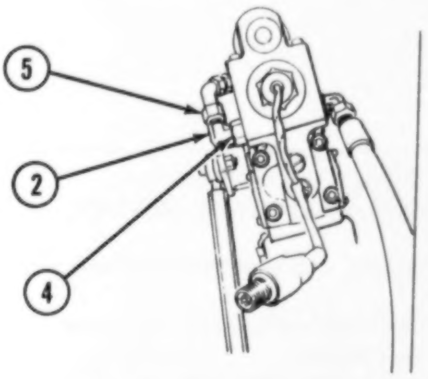
6. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO DRAIN ELBOW.
   - Remove plug and cap from hose (5) and elbow (2).
   - Connect hose (5) to elbow (2). Use 3/4 inch open end wrench.
   - Tighten nut (4). Use 11/16 inch open end wrench.



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7. CONNECT CONNECTOR P31 (6) TO RECEPTACLE J31 (7), AND TURN CONNECTOR SLEEVE (8).

8. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

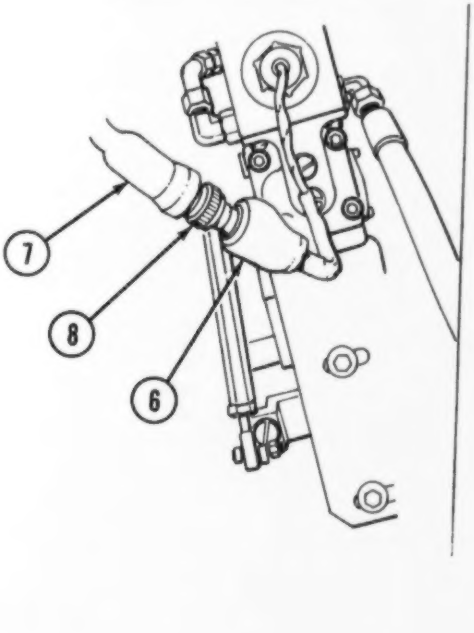
9. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

10. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)

11. PLACE HYDRAULIC SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)

12. STOP ENGINE. (SEE TM 9-1095-205-20.)

13. PERFORM SERVO ACTUATOR OPERATIONAL CHECK. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-359.)



## C. SERVO ACTUATOR OPERATIONAL CHECK

**NOTE**

***PRELIMINARY PROCEDURES:***

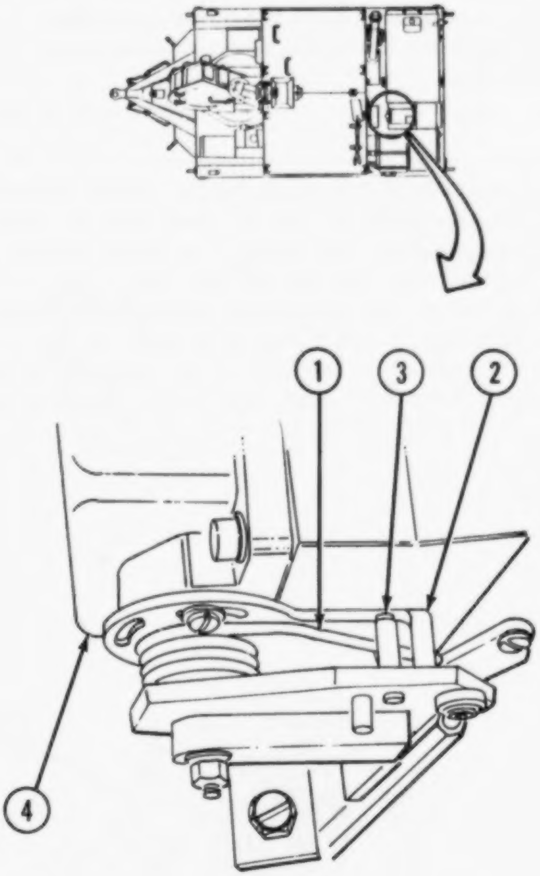
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. INSPECT SPRING AND SPRING LOCATION.
   - Check that two ends of spring (1) are held by two back plate retainers (2) and two drive lever pins (3).
   - If spring (1) is broken or is not held by two back plate retainers (2) and drive lever pins (3), servo actuator (4) is faulty.

**NOTE**

Do not change turnbuckle length.

2. REMOVE TURNBUCKLE ROD END FROM DRIVE LEVER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-354.)
3. START ENGINE. (SEE TM 9-1095-205-10.)
4. SET MODE SELECT SWITCH ON OPERATOR CONTROL BOX (OCB) TO OFF. (SEE TM 9-1095-205-10.)
5. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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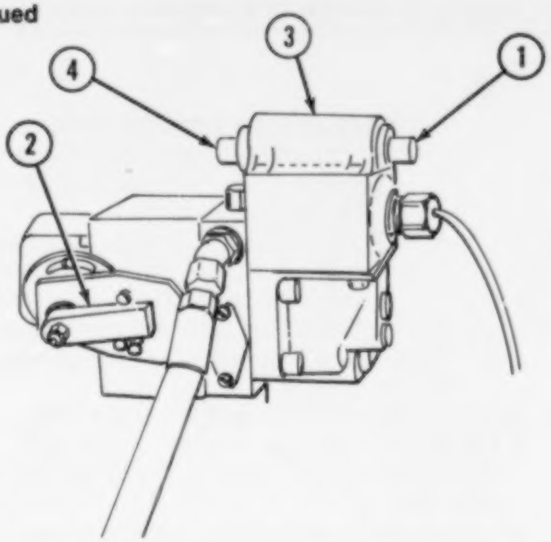
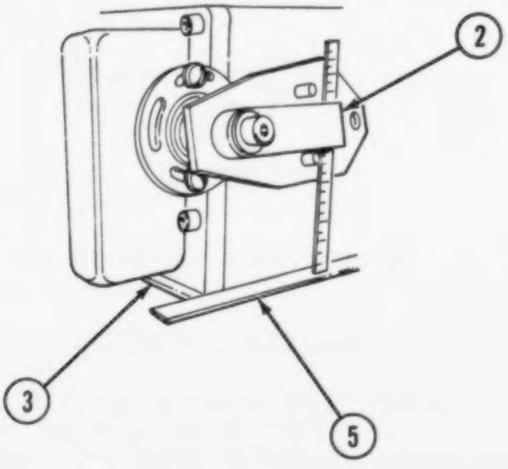
## C. SERVO ACTUATOR OPERATIONAL CHECK — Continued

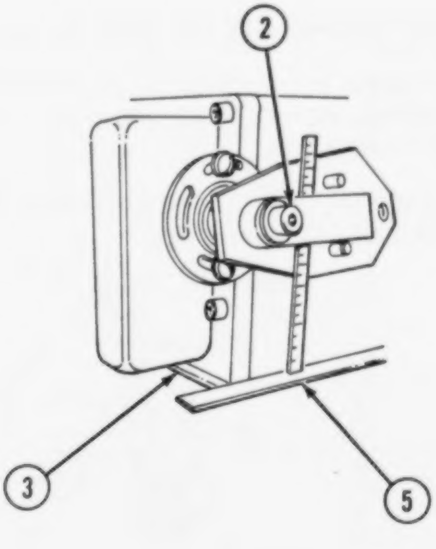


6. CHECK LEVER ARM NEUTRAL POSITION.
   - Press right manual override button (1). Lever arm (2) should move down.
   - Release right override button (1). Lever arm (2) should return to neutral (center).
   - If lever arm (2) does not move down or does not return to neutral, servo actuator (3) is faulty.
   - Press left manual override button (4). Lever arm (2) should move up.
   - Release left override button (4). Lever arm (2) should return to neutral (center).
   - If lever arm (2) does not move up or does not return to neutral, servo actuator (3) is faulty.

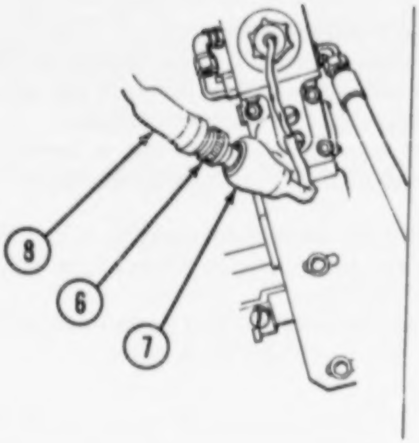
---

7. MEASURE DISTANCE BETWEEN LEVER ARM AND SERVO ACTUATOR BASE.
   - Position straight edge (5) along base of servo actuator (3). Use machinist's rule.
   - Measure and note distance between left top of lever arm (2) and straight edge (5) at base of servc actuator (3). Use 6 inch steel rule.
   - Measure and note distance between right top of lever arm (2) and straight edge (5) at base of servo actuator (3). Use 6 inch steel rule.
   - If difference between two measurements is less than 1/8 in. (3.2 mm), go to step 18.
   - If difference between two measurements is greater than 1/8 in. (3.2 mm), stop engine. (See TM 9-1095-205-20.)





8. TURN CONNECTOR SLEEVE (6), AND DISCONNECT CONNECTOR P31 (7) FROM RECEPTACLE J31 (8).
9. START ENGINE. (SEE TM 9-1095-205-10.)
10. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)
11. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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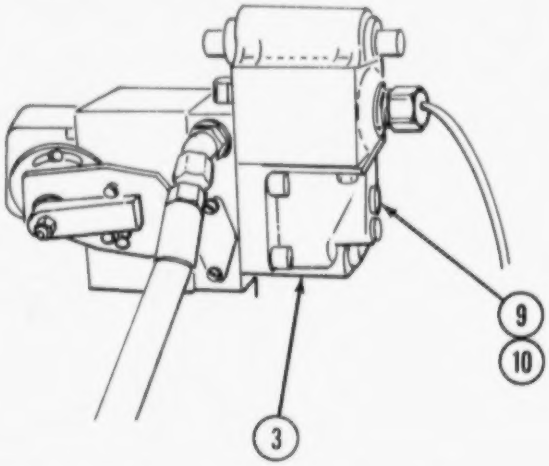
12. ADJUST NULL SCREW.
    - Remove cap (9) from servo actuator (3). Use 3/8 inch flat tip screwdriver.
    - Turn null screw (10) until difference between two measurements in step 7 is less than 1/8 in. (3.2 mm). Use 1/4 inch flat tip screwdriver.
    - Install cap (9) on servo actuator (3). Use 3/8 inch flat tip screwdriver.
13. STOP ENGINE. (SEE TM 9-1095-205-20.)



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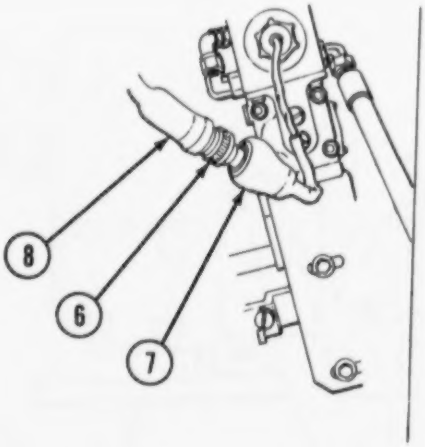
14. CONNECT CONNECTOR P31 (7) TO RECEPTACLE J31 (8), AND TURN CONNECTOR SLEEVE (6).
15. START ENGINE. (SEE TM 9-1095-205-10.)
16. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)
17. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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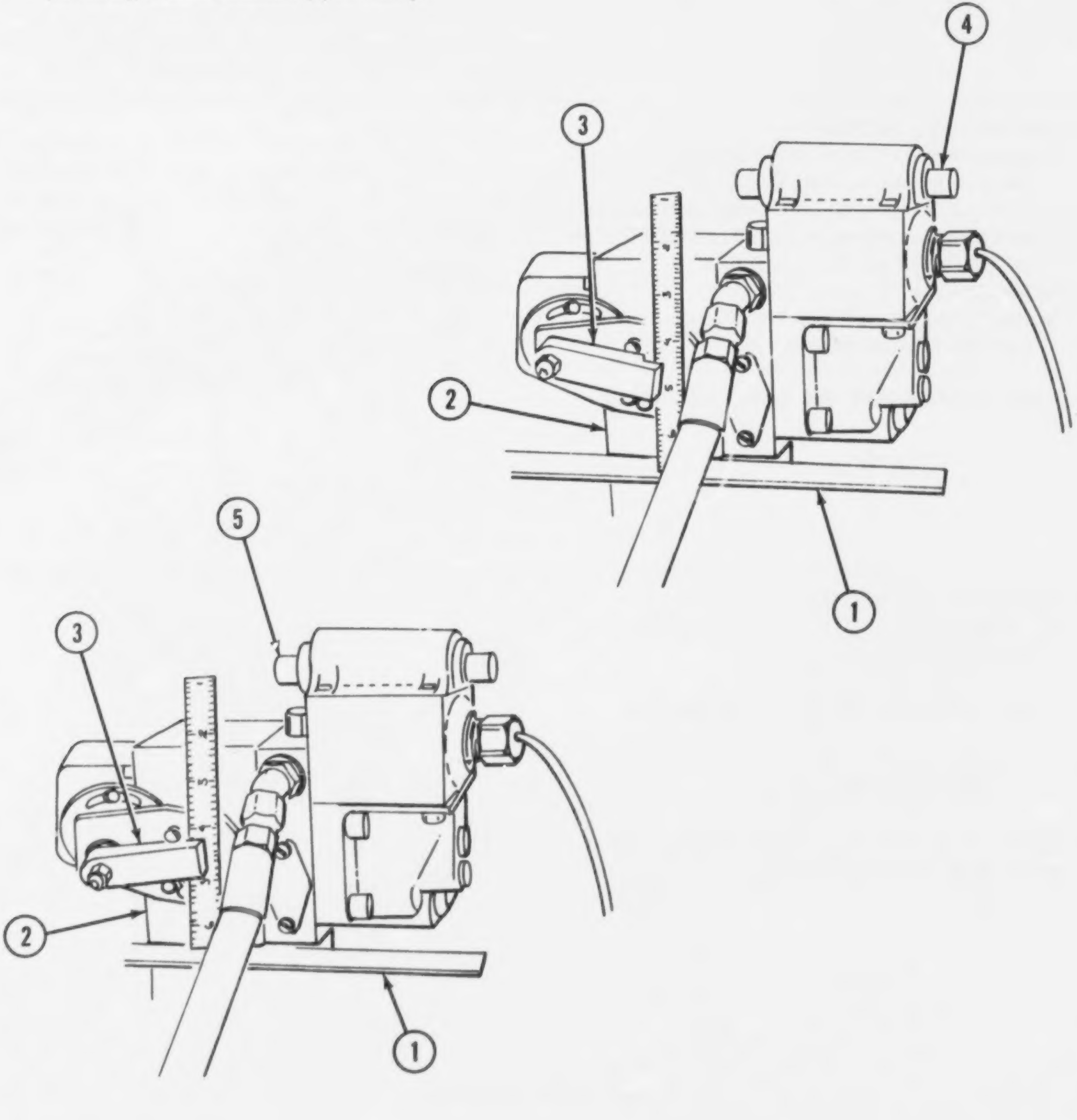
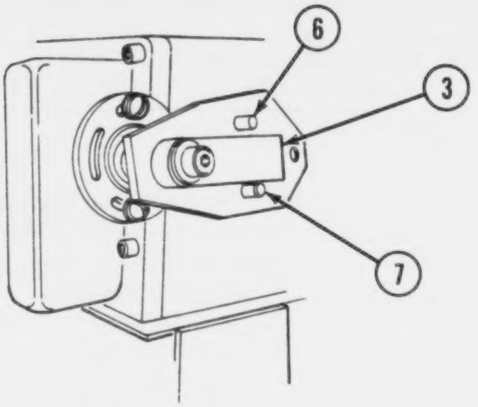
## C. SERVO ACTUATOR OPERATIONAL CHECK — Continued

18. CHECK LEVER ARM TRAVEL.
    - Position straight edge (1) along base of servo actuator (2). Use machinist's rule.
    - Measure and note distance between top end of lever arm (3), in neutral (center) position, and straight edge (1). Use 6 inch steel rule.
    - Press and hold right manual override button (4). Lever arm (3) will move down.
    - Measure and note distance between top end of lever arm (3) and straight edge (1). Use 6 inch steel rule.
    - Press and hold left manual override button (5). Lever arm (3) will move up.
    - Measure and note distance between top end of lever arm (3) and straight edge (1). Use 6 inch steel rule.
    - If difference between up and down travel distance from neutral position is more than 1/8 in. (3.2 mm), servo actuator (2) is faulty.



19. MEASURE DISTANCE BETWEEN LEVER ARM AND SPRING PINS.
    - Measure and note gap between upper pin (6) and upper surface of lever arm (3). Use thickness gage.
    - Measure and note gap between lower pin (7) and lower surface of lever arm (3). Use thickness gage.
    - If difference between two measurements is more than 0.030 in. (0.76 mm), adjust back plate. (See Right Magazine Pump Assembly and Servo Actuator, Page 15-364.)
    - If difference between two measurements is less than 0.030 in. (0.76 mm), stop engine. (See TM 9-1095-205-20.)



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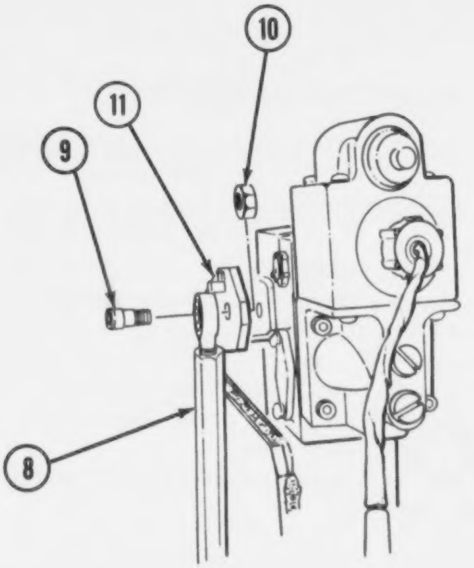
20. INSTALL TURNBUCKLE ROD END ON DRIVE LEVER.
    - Install turnbuckle (8), screw (9), and new self-locking nut (10) on drive lever (11). Use 5/32 inch hex key and 7/16 inch box end wrench.

21. ADJUST MAGAZINE PUMPS LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

GO TO NEXT PAGE

## 15-26 RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR — Continued

### D. SERVO ACTUATOR BACK PLATE ADJUSTMENT

**NOTE**

***PRELIMINARY PROCEDURES:***

Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. REMOVE TURNBUCKLE ROD END FROM DRIVE LEVER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-354.)

2. START ENGINE. (SEE TM 9-1095-205-10.)

3. SET MODE SELECT SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)

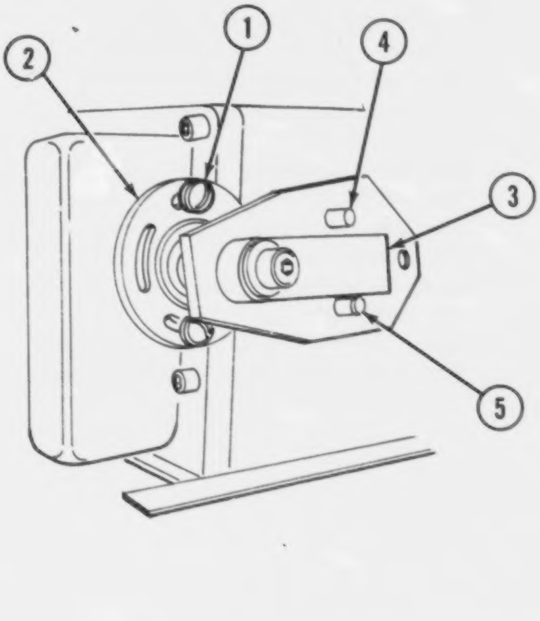
4. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)

5. ADJUST BACK PLATE.
   - Loosen two screws (1) until back plate (2) moves freely. Use 5/16 inch flat tip screwdriver.
   - Rotate back plate (2) until lever arm (3) is centered between upper pin (4) and lower pin (5). Use thickness gage.
   - Tighten two screws (1). Use 5/16 inch flat tip screwdriver.

6. STOP ENGINE. (SEE TM 9-1095-205-20.)

7. INSTALL TURNBUCKLE ROD END ON DRIVE LEVER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-363.)

8. ADJUST MAGAZINE PUMPS LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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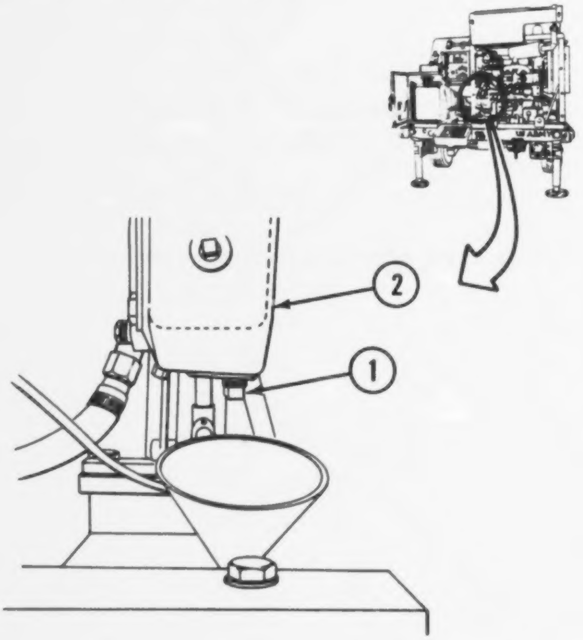
## E. PUMP ASSEMBLY REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. DRAIN PUMP ASSEMBLY.
   - Remove drain plug (1) from pump assembly (2), and drain hydraulic fluid. Use 9/16 inch open end wrench, funnel, suitable hose, and drain pan.
   - Install drain plug (1) in pump assembly (2). Use 9/16 inch open end wrench.
   - Dispose of drained fluid according to local procedures.



2. REMOVE SERVO ACTUATOR FROM RIGHT MAGAZINE PUMP ASSEMBLY. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-352.)

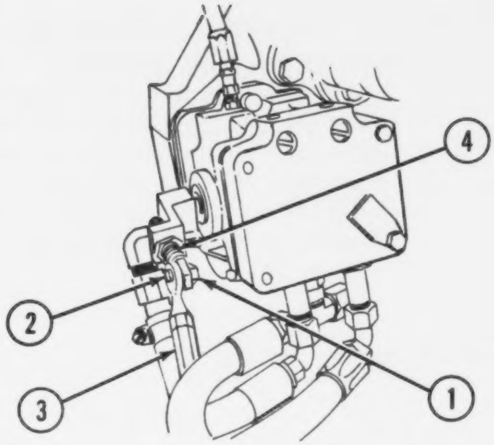
GO TO NEXT PAGE

## E. PUMP ASSEMBLY REMOVAL — Continued

**NOTE**

Do not change turnbuckle length when removing turnbuckle.

3. REMOVE TURNBUCKLE FROM ADJUSTING ROD.
   - Remove self-locking nut (1), screw (2), and turnbuckle (3) from adjusting rod (4). Use 5/32 inch hex key and 7/16 inch box end wrench. Discard self-locking nut.



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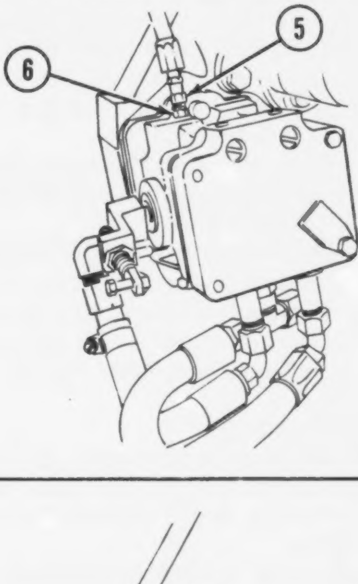
4. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (5) from adapter (6). Use 11/16 inch open end wrench.
   - Plug hose, and cap adapter.



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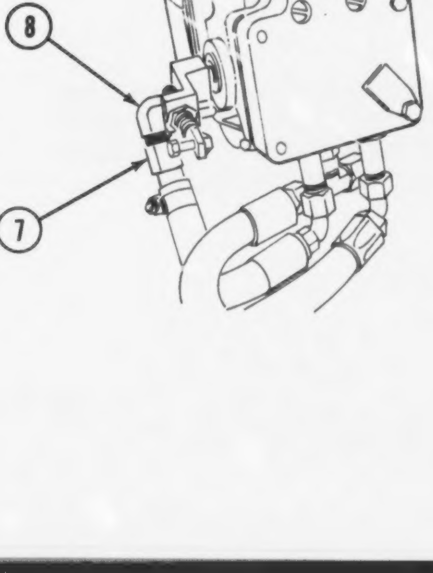
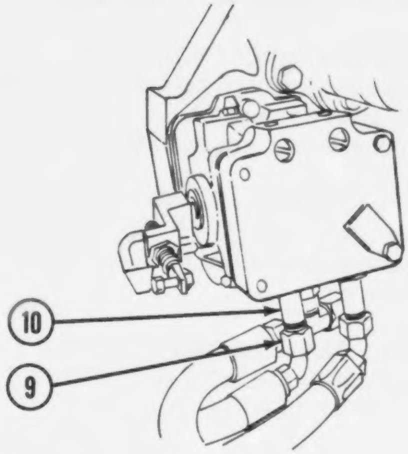
5. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW ASSEMBLY.
   - Disconnect hose (7) from elbow assembly (8). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap elbow assembly.



6. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (9) from adapter (10). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



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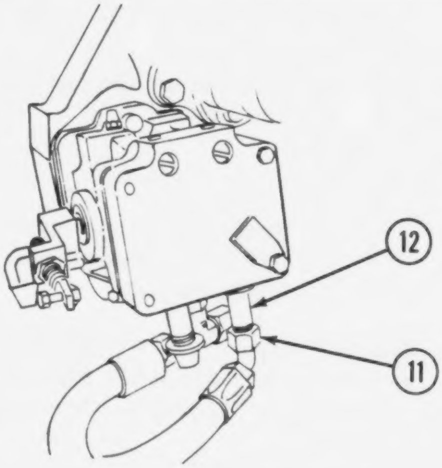
7. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (11) from adapter (12). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.



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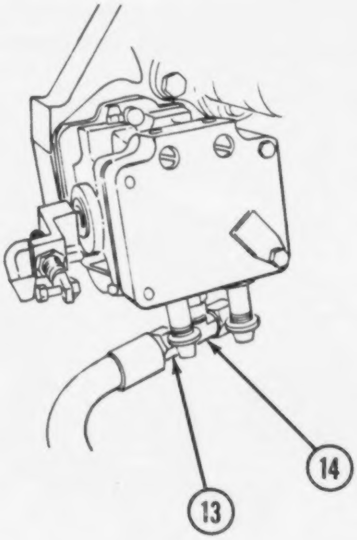
8. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM TEE ASSEMBLY.
   - Disconnect hose (13) from tee assembly (14). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap tee assembly.



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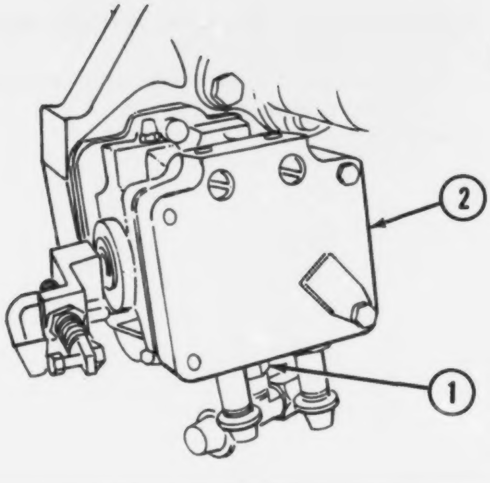
**E. PUMP ASSEMBLY REMOVAL — Continued**

9. REMOVE TEE ASSEMBLY FROM PUMP.
   - Remove tee assembly (1) from pump (2). Use 1 1/8 inch open end wrench.
   - Plug pump, and cap tee assembly.

**NOTE**

Disassemble tee assembly only if required for maintenance.

10. DISASSEMBLE TEE ASSEMBLY. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-373.)



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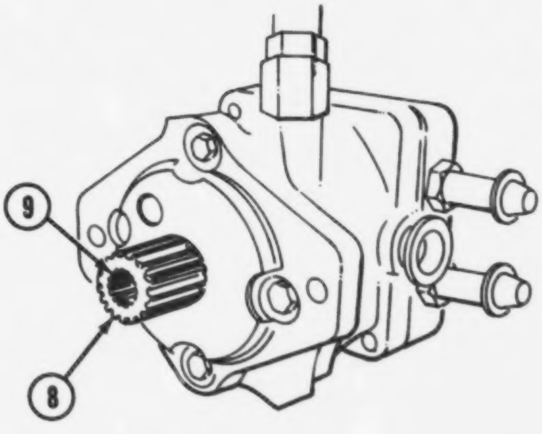
**WARNING**

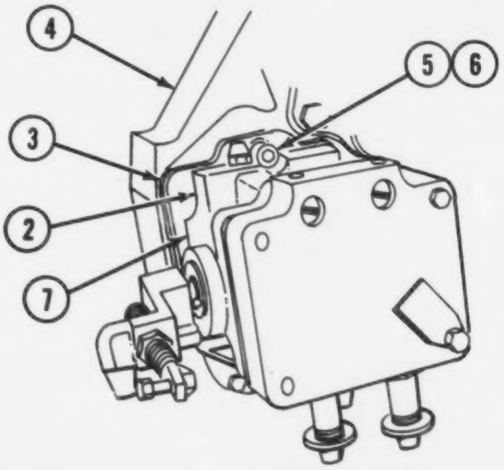
Cleaning solvent can explode and can burn. Read warning on front page of this manual.

**CAUTION**

Pump adapter can fall and damage parts when pump is removed from pump drive assembly. Hold adapter in place on pump drive assembly during pump removal.

11. REMOVE PUMP FROM PUMP DRIVE ASSEMBLY.
   - Have helper hold adapter plate (3) on drive assembly (4). Remove two screws (5), lock washers (6), pump (2), and gasket (7) from drive assembly. Use 3/8 inch hex key. Discard lock washers and gasket.
   - Install two screws (5) and adapter plate (3) on drive assembly (4). Use 3/8 inch hex key.
   - Remove splined adapter (8) from pump shaft (9).
   - Clean gasket mating surfaces on pump (2) and adapter plate (3). Use putty knife, solvent, and rags.
   - Cover adapter plate (3). Use plastic sheet and masking tape.

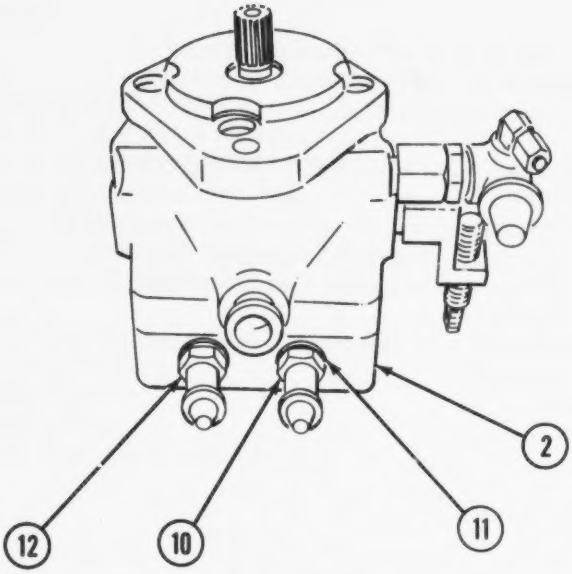




**NOTE**

Do not remove feed line pump adapters unless required for maintenance.

12. REMOVE TWO FEED LINE PUMP ADAPTERS FROM PUMP.
    - Remove adapter (10) from pump (2). Use 7/8 inch open end wrench.
    - Remove preformed packing (11) from adapter (10). Discard preformed packing.
    - Plug pump, and cap adapter.
    - Repeat above removal steps for other adapter (12).



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**NOTE**

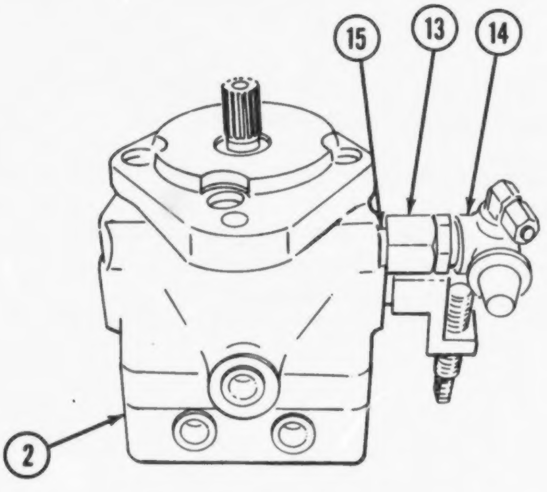
Do not remove special pump elbow assembly unless required for maintenance.

13. REMOVE SPECIAL PUMP ELBOW ASSEMBLY FROM PUMP.
    - Remove adapter (13) with elbow assembly (14) from pump (2). Use 1 1/8 inch open end wrench.
    - Remove preformed packing (15) from adapter (13). Discard preformed packing.
    - Plug pump, and cap adapter.

**NOTE**

Do not disassemble special pump elbow assembly unless required for maintenance.

14. DISASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-374.)



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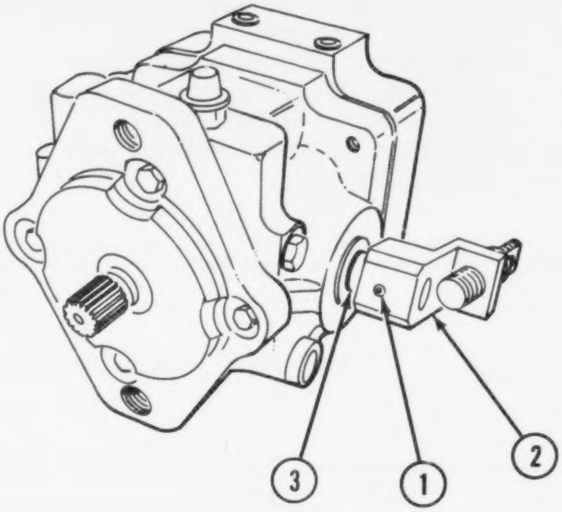
## E. PUMP ASSEMBLY REMOVAL — Continued

**NOTE**

Do not remove arm assembly unless required for maintenance or to replace trunnion shaft lip seal.

15. REMOVE ARM ASSEMBLY FROM TRUNNION SHAFT.
    - Remove spring pin (1) from arm assembly (2) and trunnion shaft (3). Use 3/16 inch pin punch and ball peen hammer. Discard spring pin.
    - Remove arm assembly (2) from trunnion shaft (3).



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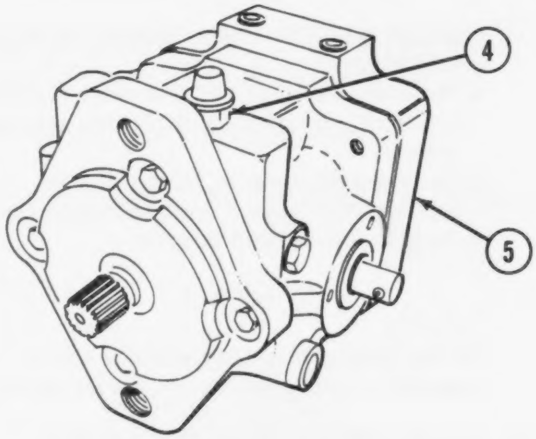
**NOTE**

Do not remove servo filter feed adapter unless required for maintenance.

16. REMOVE SERVO FILTER FEED ADAPTER FROM PUMP.
    - Remove adapter (4) from pump (5). Use 5/8 inch socket with ratchet handle.
    - Plug pump, and cap adapter.



## F. INPUT AND TRUNNION SHAFTS LIP SEALS REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

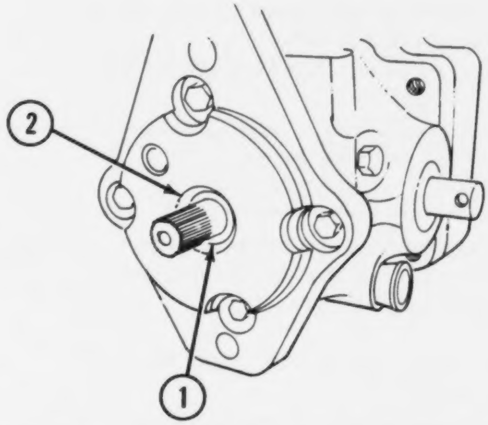
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)

1. REMOVE RIGHT MAGAZINE PUMP ASSEMBLY FROM DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-365.)

**NOTE**

If removing only trunnion shaft lip seals, go to step 3.

2. REMOVE INPUT SHAFT LIP SEAL FROM INPUT SHAFT BORE.
   - Punch hole in seal (1). Use center punch and ball peen hammer.
   - Pry seal (1) from input shaft bore (2). Use center punch. Discard seal.



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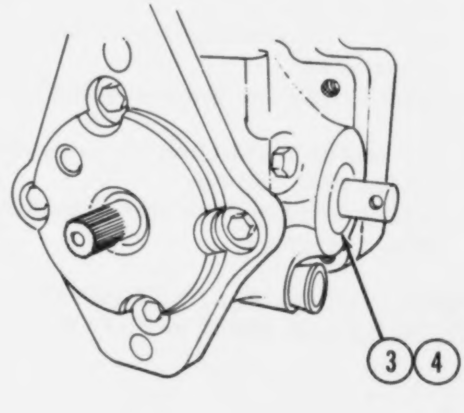
**NOTE**

Right magazine pump assembly has two trunnion shaft lip seals. Both seals are removed the same way.

3. REMOVE TWO TRUNNION SHAFT LIP SEALS FROM SHAFT BORE.
   - Punch hole in seal (3). Use center punch and ball peen hammer.
   - Pry seal (3) from shaft bore (4). Use center punch. Discard seal.
   - Repeat above removal steps for other seal.



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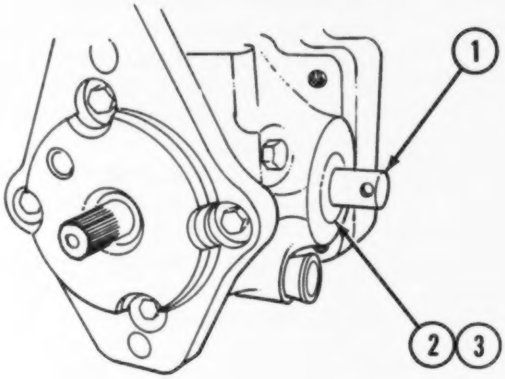
## G. INPUT AND TRUNNION SHAFTS LIP SEALS INSTALLATION

### NOTE

If installing only input shaft lip seal, go to step 2.

• • • •

Right magazine pump assembly has two trunnion shaft lip seals. Both seals are installed the same way.



1. INSTALL TWO TRUNNION SHAFT LIP SEALS IN SHAFT BORE.
   - Polish shaft (1). Use crocus cloth.
   - Lubricate shaft (1) and new seal (2). Use hydraulic fluid.
   - Install seal (2) on shaft (1).
   - Seat seal (2) in shaft bore (3). Use mandrel and ball peen hammer.
   - Repeat above installation steps for other seal.

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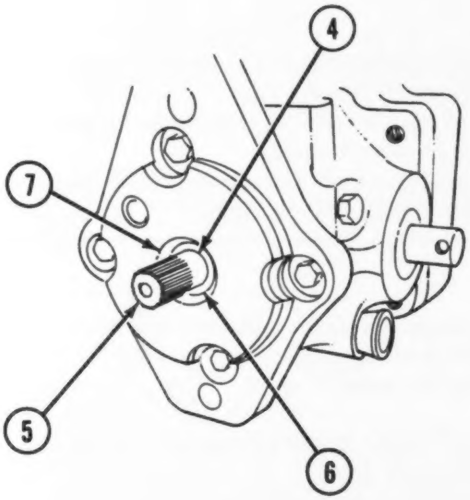
### CAUTION

Splined shaft has sharp edges that can cut seal during installation. Splined shaft must be wrapped to protect seal.



2. INSTALL INPUT SHAFT LIP SEAL IN INPUT SHAFT BORE.
   - Polish shaft extension (4). Use crocus cloth.
   - Wrap splined shaft (5). Use plastic sheet.
   - Apply light coat of hydraulic fluid to new seal (6), shaft extension (4), and wrapped splined shaft (5).
   - Install seal (6) over wrapped splined shaft (5).
   - Seat seal (6) in shaft bore (7). Use mandrel and ball peen hammer.
   - Remove wrapping from splined shaft (5). Discard wrapping.
3. INSTALL RIGHT MAGAZINE PUMP ASSEMBLY ON DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-376.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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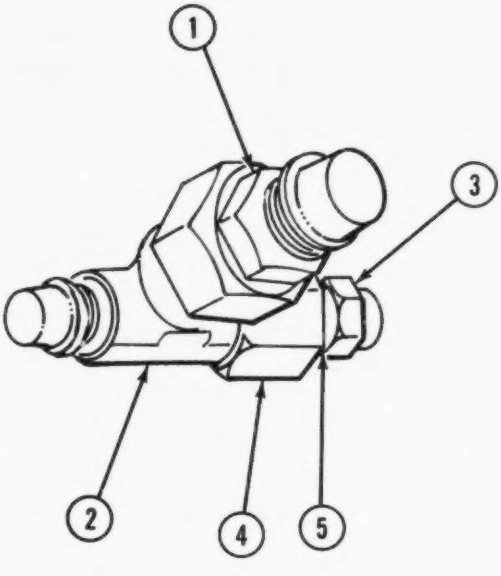
## H. TEE ASSEMBLY DISASSEMBLY

**NOTE**

Do not disassemble tee assembly unless required for maintenance.

DISASSEMBLE TEE ASSEMBLY.

- Remove reducer (1) from tee assembly (2). Use 1 inch open end and 6 inch adjustable wrenches.
- Plug tee assembly, and cap reducer.
- Remove tube cap (3) from tee assembly (2). Use 9/16 inch box end and 1 inch open end wrenches.
- Plug tube cap, and cap tee assembly.
- Remove tube coupling nut (4) and reducer tube (5) from tee assembly (2). Use 1 inch open end and 6 inch adjustable wrenches.
- Plug tee assembly and tube coupling nut, and cap reducer tube.



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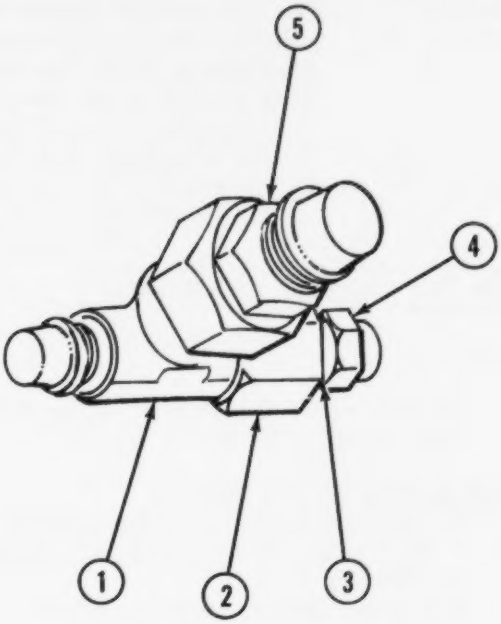
## 15-26 RIGHT MAGAZINE ASSEMBLY AND SERVO ACTUATOR — Continued

### I. TEE ASSEMBLY REASSEMBLY

REASSEMBLE TEE ASSEMBLY.

- Remove plugs and caps from tee assembly (1), tube coupling nut (2), and reducer tube (3).
- Install reducer tube (3) and tube coupling nut (2) on tee assembly (1). Use 1 inch open end and 6 inch adjustable wrenches.
- Remove plug and cap from tube cap (4) and tee assembly (1).
- Install tube cap (4) on tee assembly (1). Use 9/16 inch box end and 1 inch open end wrenches.
- Remove plug and cap from tee assembly (1) and reducer (5).
- Install reducer (5) on tee assembly (1). Use 1 inch open end and 6 inch adjustable wrenches.



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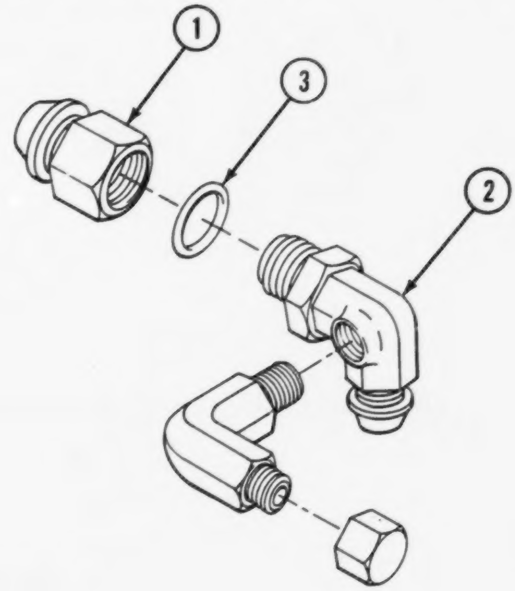
### J. SPECIAL PUMP ELBOW ASSEMBLY DISASSEMBLY

**NOTE**

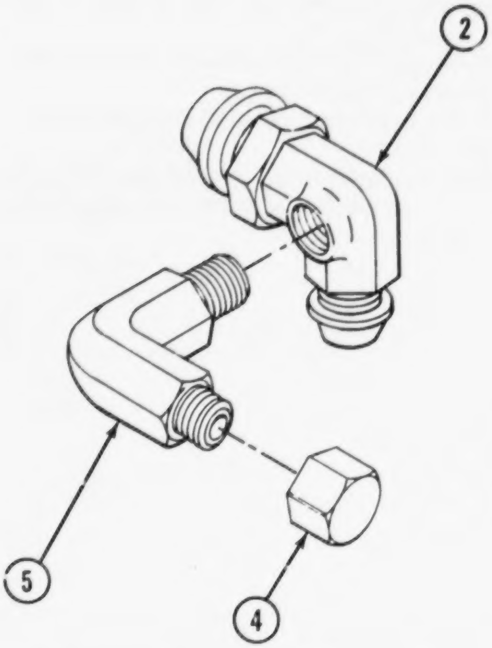
Do not disassemble special pump elbow assembly unless required for maintenance.

DISASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY.

- Remove adapter (1) from special elbow (2). Use 1 1/8 inch open end and 6 inch adjustable wrenches.
- Remove preformed packing (3) from special elbow (2). Discard preformed packing.
- Plug adapter, and cap special elbow.



- Remove tube cap (4) from elbow (5). Use 9/16 inch open end and 6 inch adjustable wrenches.
- Plug tube cap, and cap elbow.
- Remove elbow (5) from special elbow (2). Use two 6 inch adjustable wrenches.
- Plug special elbow, and cap elbow.



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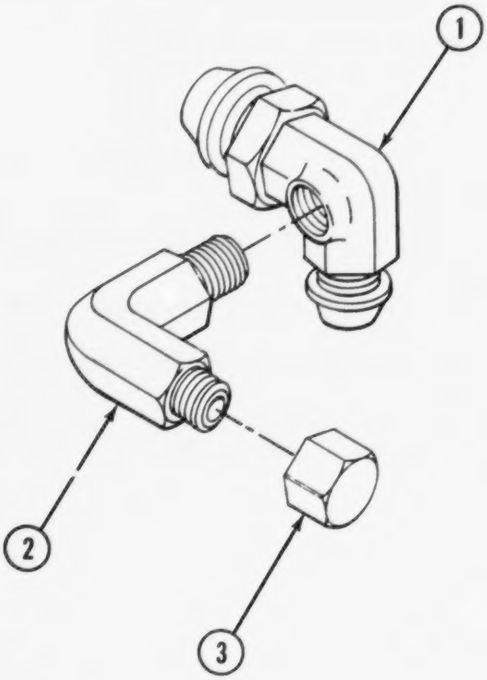
## K. SPECIAL PUMP ELBOW ASSEMBLY REASSEMBLY

REASSEMBLE SPECIAL PUMP ELBOW ASSEMBLY.

- Remove plug and cap from special elbow (1) and elbow (2).
- Apply sealing compound to threads of elbow (2).
- Install elbow (2) on special elbow (1). Use two 6 inch adjustable wrenches.
- Remove plug and cap from tube cap (3) and elbow (2).
- Apply sealing compound to threads of elbow (2).
- Install tube cap (3) on elbow (2). Use 9/16 inch open end and 6 inch adjustable wrenches.



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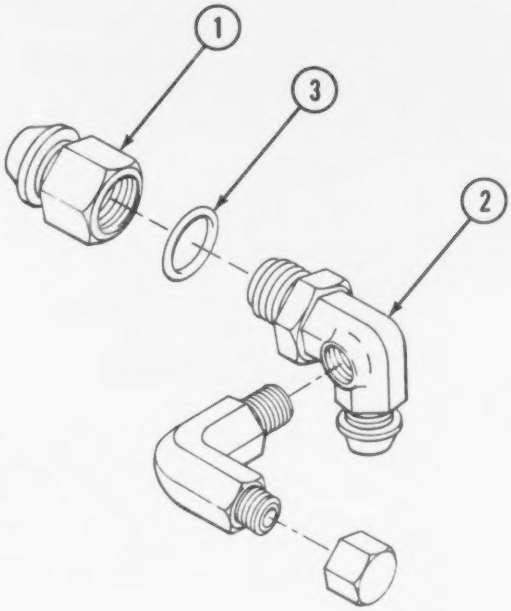
## K. SPECIAL PUMP ELBOW ASSEMBLY REASSEMBLY — Continued

- Remove plug and cap from adapter (1) and special elbow (2).
- Apply light coat of hydraulic fluid on new preformed packing (3).
- Install preformed packing (3) on special elbow (2).
- Install adapter (1) on special elbow (2). Use 1 1/8 inch open end and 6 inch adjustable wrenches.



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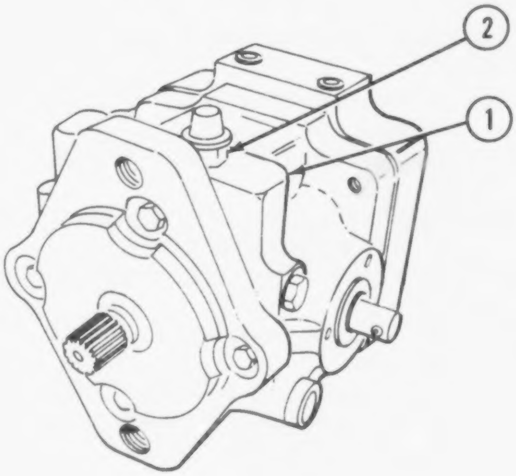
## L. PUMP ASSEMBLY INSTALLATION

### NOTE

If servo filter feed adapter was not removed, go to step 2.

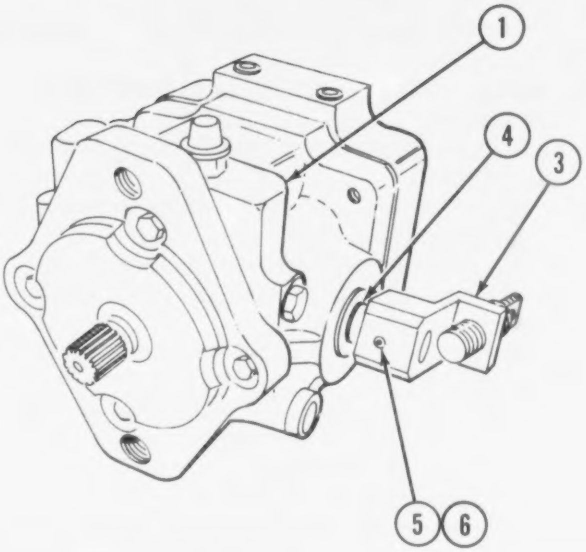
1. INSTALL SERVO FILTER FEED ADAPTER ON PUMP.
   - Remove plug and cap from pump (1) and adapter (2).
   - Apply sealing compound to threads of adapter (2).
   - Install adapter (2) on pump (1). Use 5/8 inch socket with ratchet handle.



**NOTE**

If arm assembly was not removed, go to step 3.

2. INSTALL ARM ASSEMBLY ON TRUNNION SHAFT.
   - Place arm assembly (3), with flats to rear of pump (1), on trunnion shaft (4).
   - Aline spring pin mounting holes (5) in arm assembly (3) and trunnion shaft (4).
   - Install new spring pin (6) in arm assembly (3) and trunnion shaft (4). Use ball peen hammer.



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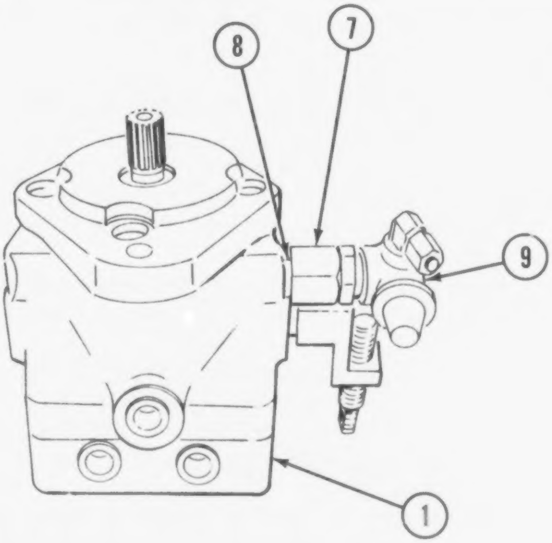
**NOTE**

If special pump elbow assembly was not removed, go to step 4.

3. INSTALL SPECIAL PUMP ELBOW ASSEMBLY ON PUMP.
   - Remove plug and cap from pump (1) and adapter (7).
   - Apply light coat of oil to new preformed packing (8).
   - Install preformed packing (8) on adapter (7).
   - Install adapter (7) with elbow assembly (9) on pump (1). Use 1 1/8 inch open end wrench.



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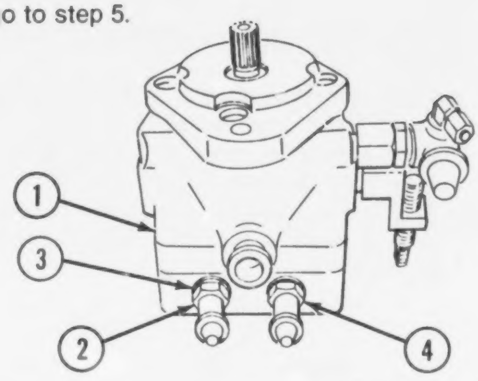
## L. PUMP ASSEMBLY INSTALLATION — Continued

**NOTE**

If feed line pump adapters were not removed, go to step 5.



4. INSTALL TWO FEED LINE PUMP ADAPTERS ON PUMP.
   - Remove plug and cap from pump (1) and adapter (2).
   - Apply light coat of hydraulic fluid to new preformed packing (3).
   - Install preformed packing (3) on adapter (2).
   - Install adapter (2) on pump (1). Use 7/8 inch open end wrench.
   - Repeat above installation steps for other adapter (4).

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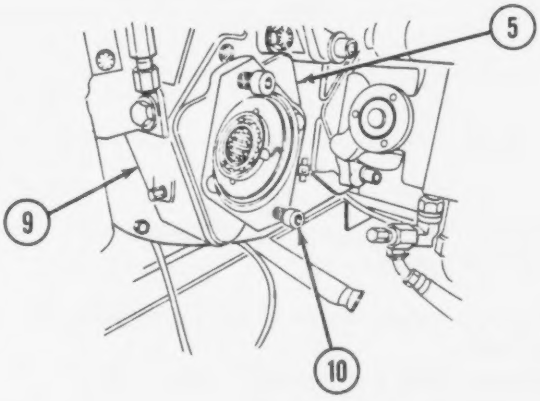
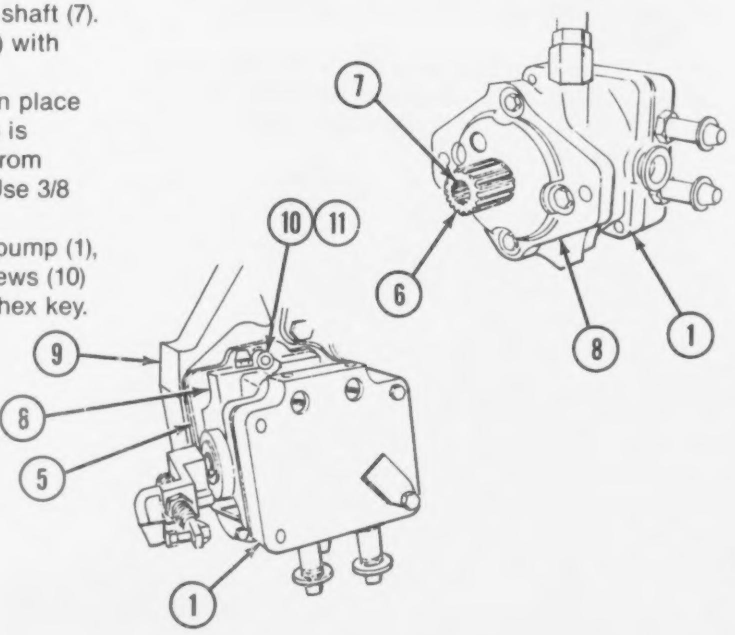


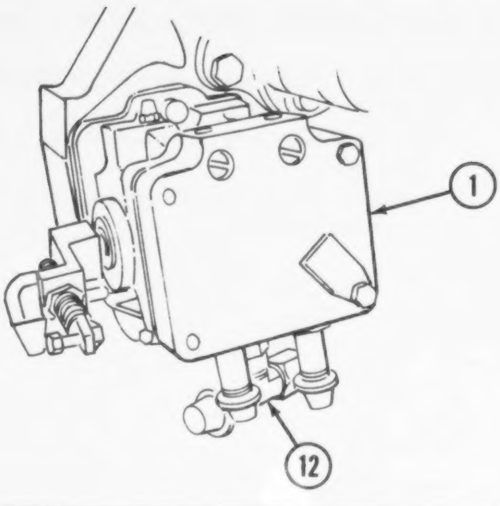
**CAUTION**

Pump adapter can fall and damage parts when pump is being installed on pump drive assembly. Hold adapter in place on pump drive assembly during pump installation.

5. INSTALL PUMP ON PUMP DRIVE ASSEMBLY.
   - Remove plastic sheet and masking tape from adapter plate (5). Discard plastic sheet.
   - Apply light coat of sealing compound to gasket mounting surfaces of pump (1) and adapter plate (5).
   - Install splined adapter (6) on pump shaft (7).
   - Position new gasket (8) on pump (1) with mounting holes alined.
   - Have helper hold adapter plate (5) in place on drive assembly (9) until pump (1) is installed. Remove two screws (10) from adapter plate and drive assembly. Use 3/8 inch hex key.
   - Install adapter plate (5), gasket (8), pump (1), two new lock washers (11), and screws (10) on drive assembly (9). Use 3/8 inch hex key. Use helper.



6. INSTALL TEE ASSEMBLY ON PUMP.
   - Remove plug and cap from pump (1) and tee assembly (12).
   - Apply sealing compound to threads of tee assembly (12).
   - Install tee assembly (12) on pump (1). Use 1 1/8 inch open end wrench.



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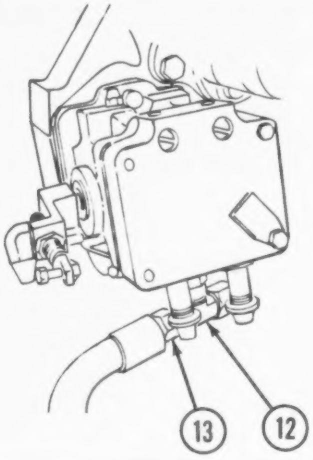
7. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO TEE ASSEMBLY.
   - Remove plug and cap from hose (13) and tee assembly (12).
   - Connect hose (13) to tee assembly (12). Use 1 1/16 inch open end wrench.



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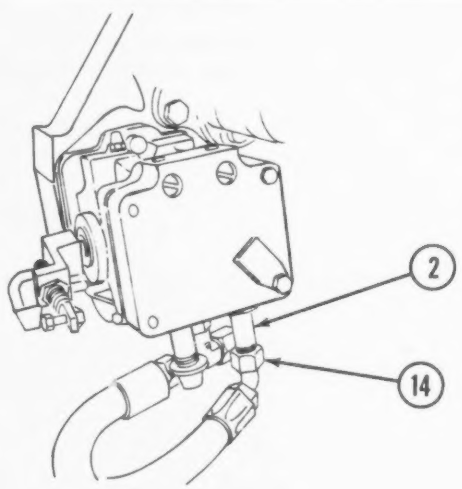
8. CONNECT FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (14) and adapter (2).
   - Connect hose (14) to adapter (2). Use 7/8 inch open end wrench.



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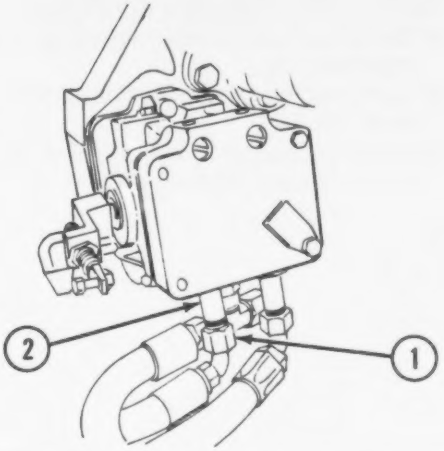
## L. PUMP ASSEMBLY INSTALLATION — Continued

9. CONNECT FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 7/8 inch open end wrench.



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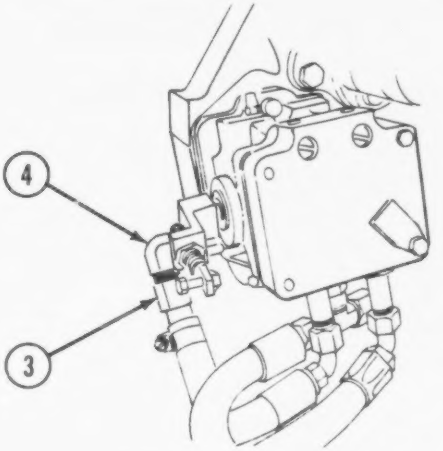
10. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW ASSEMBLY.
    - Remove plug and cap from hose (3) and elbow assembly (4).
    - Connect hose (3) to elbow assembly (4). Use 1 1/4 inch open end wrench.



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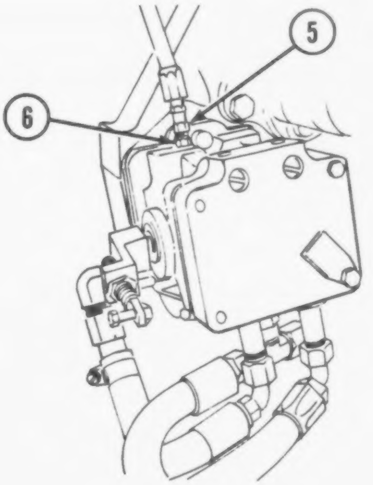
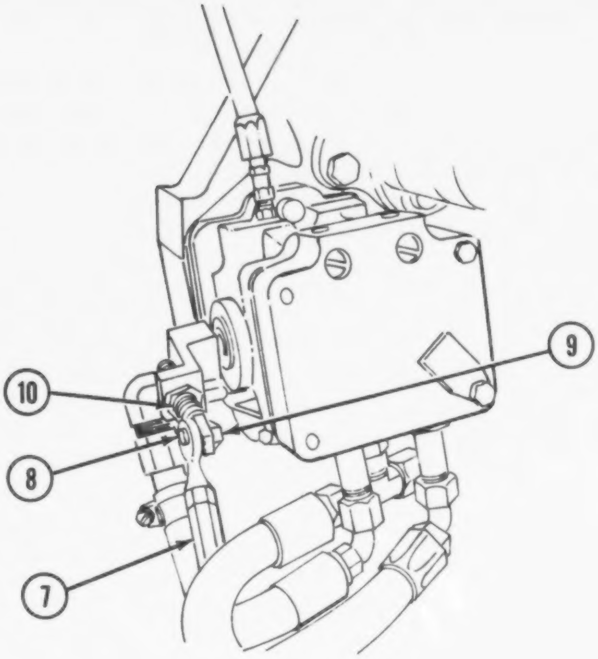
11. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (5) and adapter (6).
    - Connect hose (5) to adapter (6). Use 11/16 inch open end wrench.



12. INSTALL TURNBUCKLE ON ADJUSTING ROD.
    - Install turnbuckle (7), screw (8), and new self-locking nut (9) on adjusting rod (10). Use 5/32 inch hex key and 7/16 inch box end wrench.



13. INSTALL SERVO ACTUATOR ON RIGHT MAGAZINE PUMP ASSEMBLY. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-356.)
14. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)
15. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)
16. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)
17. PLACE HYDRAULIC SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)
18. STOP ENGINE. (SEE TM 9-1095-205-20.)
19. PERFORM SERVO ACTUATOR OPERATIONAL CHECK. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-359.)
20. ADJUST RIGHT MAGAZINE PUMP LINKAGE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-401.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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END OF TASK

## 15-27 RIGHT MAGAZINE PUMP LINES

### DESCRIPTION

This task covers:
A. SERVO FILTER FEED HOSE ASSEMBLY REMOVAL (p 15-384)
B. SERVO FILTER FEED HOSE ASSEMBLY INSTALLATION (p 15-385)
C. SERVO ACTUATOR DRAIN HOSE ASSEMBLY REMOVAL (p 15-387)
D. SERVO ACTUATOR DRAIN HOSE ASSEMBLY INSTALLATION (p 15-388)
E. MAGAZINE PUMP SUCTION HOSE ASSEMBLY REMOVAL (p 15-389)
F. MAGAZINE PUMP SUCTION HOSE ASSEMBLY INSTALLATION (p 15-390)
G. FEED LINE A HOSE ASSEMBLY REMOVAL (p 15-391)
H. FEED LINE A HOSE ASSEMBLY INSTALLATION (p 15-392)
I. FEED LINE B HOSE ASSEMBLY REMOVAL (p 15-393)
J. FEED LINE B HOSE ASSEMBLY INSTALLATION (p 15-394)
K. MAGAZINE PUMP DRAIN HOSE ASSEMBLY REMOVAL (p 15-395)
L. MAGAZINE PUMP DRAIN HOSE ASSEMBLY INSTALLATION (p 15-396)
M. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY REMOVAL (p 15-397)
N. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY INSTALLATION (p 15-398)

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### INITIAL SETUP

*Tools and Special Tools:*
General mechanic's tool kit
5180-00-177-7033:
1/4 inch flat tip screwdriver
3/8 inch open end wrench
7/8 inch open end wrench
11/16 inch open end wrench
1 1/16 inch open end wrench 5120-00-187-7134
1 1/4 inch open end wrench 5120-00-187-7134
Cap and plug set 5340-00-450-5718

*References:*
TM 9-1095-205-10
TM 9-1095-205-20

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

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### OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

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**OVERVIEW — Continued**

Hoses are not supplied as parts. If you need a new hose, see Appendix C, and make one. See:
9290551 feed line A hose assembly.

If you remove more than one hose assembly, tag and mark each one. Remove tags after hose assembly installation.

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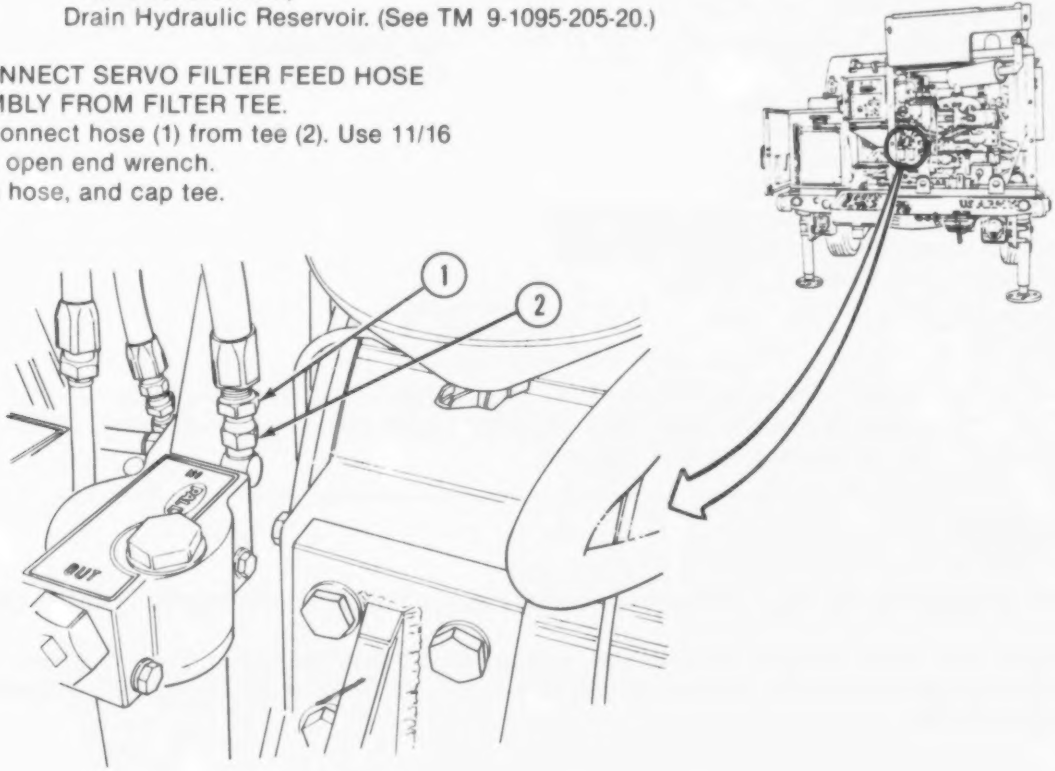
## A. SERVO FILTER FEED HOSE ASSEMBLY REMOVAL

**NOTE**

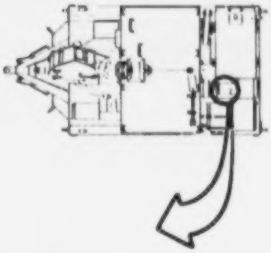
***PRELIMINARY PROCEDURES:***

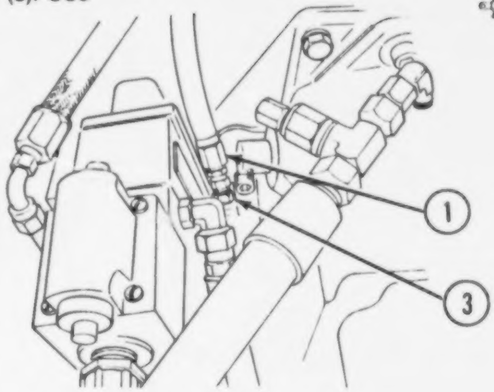
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM FILTER TEE.
   - Disconnect hose (1) from tee (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.



2. DISCONNECT SERVO FILTER FEED HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap adapter.





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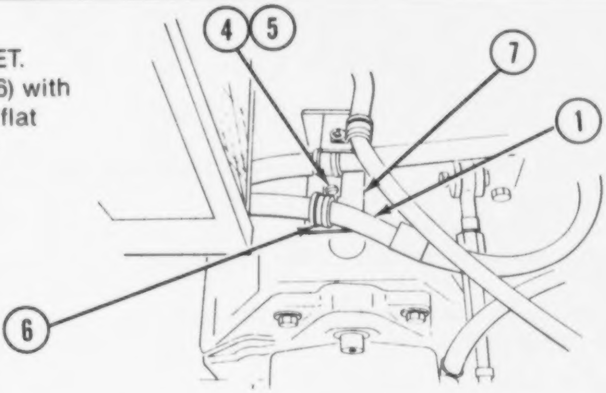
3. REMOVE SERVO FILTER FEED HOSE ASSEMBLY AND CLAMP FROM BRACKET.
   - Remove nut (4), screw (5), and clamp (6) with hose (1) from bracket (7). Use 1/4 inch flat tip screwdriver and 3/8 inch open end wrench.
   - Remove clamp (6) from hose (1).
   - Remove hose (1) from dispenser.



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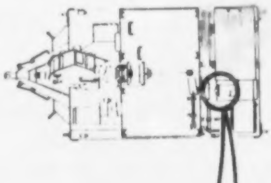
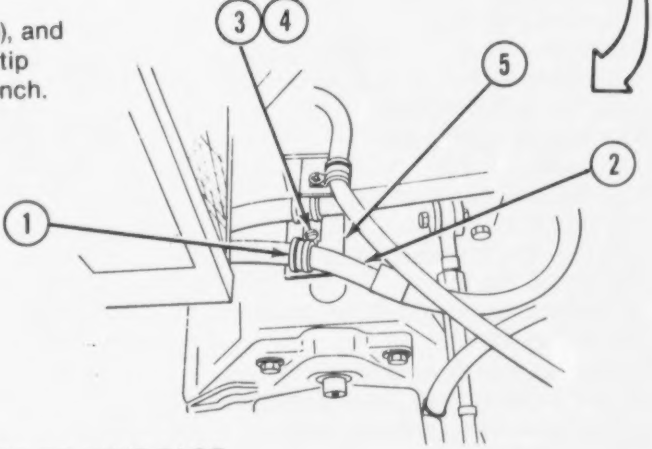
## B. SERVO FILTER FEED HOSE ASSEMBLY INSTALLATION



1. INSTALL SERVO FILTER FEED HOSE ASSEMBLY AND CLAMP ON BRACKET.
   - Place clamp (1) on hose (2).
   - Install clamp (1) with hose (2), screw (3), and nut (4) on bracket (5). Use 1/4 inch flat tip screwdriver and 3/8 inch open end wrench.



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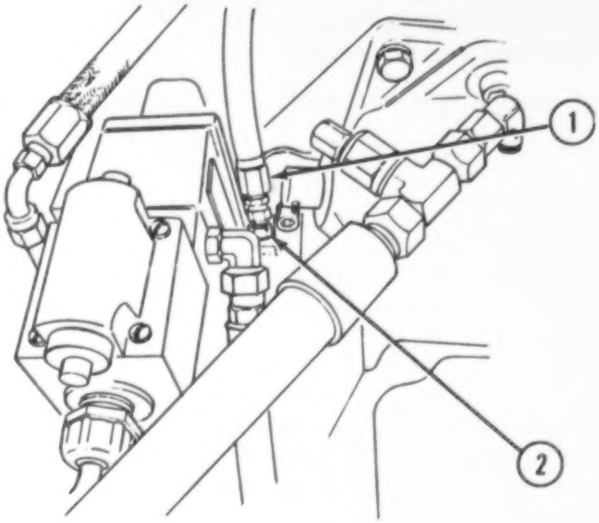
## B. SERVO FILTER FEED HOSE ASSEMBLY INSTALLATION — Continued

2. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 11/16 inch open end wrench.



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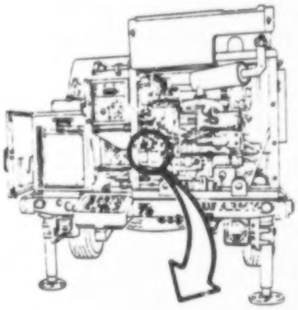
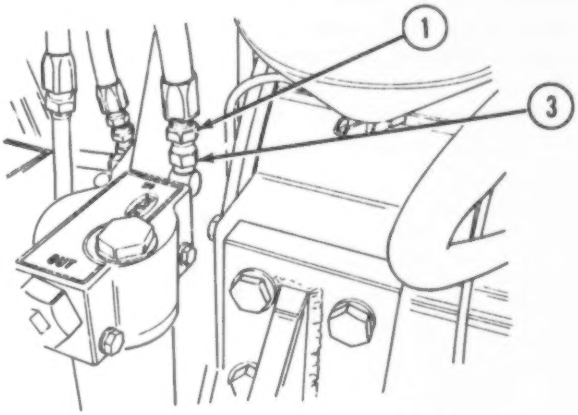
3. CONNECT SERVO FILTER FEED HOSE ASSEMBLY TO FILTER TEE.
   - Remove plug and cap from hose (1) and tee (3).
   - Connect hose (1) to tee (3). Use 11/16 inch open end wrench.



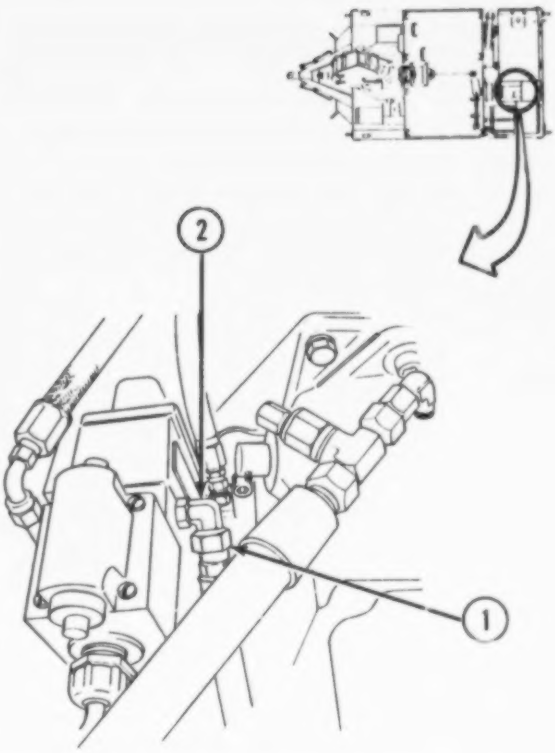
NOTE

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



## C. SERVO ACTUATOR DRAIN HOSE ASSEMBLY REMOVAL



**NOTE**

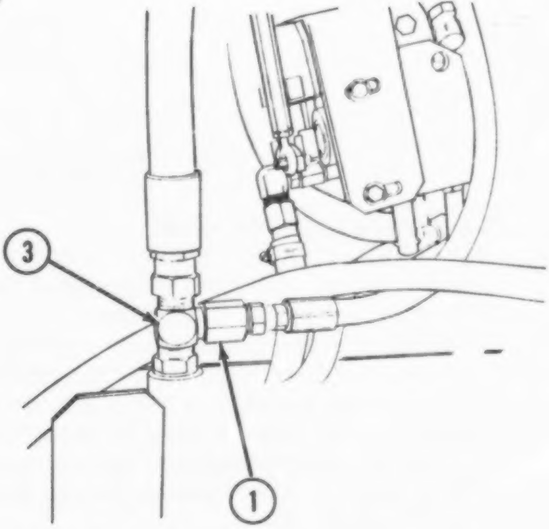
***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM SERVO ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.

---

2. DISCONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM DRAIN LINE TEE.
   - Disconnect hose (1) from tee (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.
   - Remove hose (1) from dispenser.



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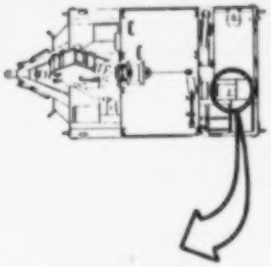
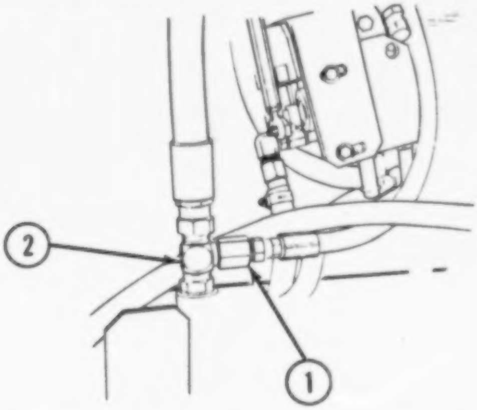
## 15-27 RIGHT MAGAZINE PUMP LINES — Continued

### D. SERVO ACTUATOR DRAIN HOSE ASSEMBLY INSTALLATION



1. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO DRAIN LINE TEE.
   - Remove plug and cap from hose (1) and tee (2).
   - Connect hose (1) to tee (2). Use 11/16 inch open end wrench.



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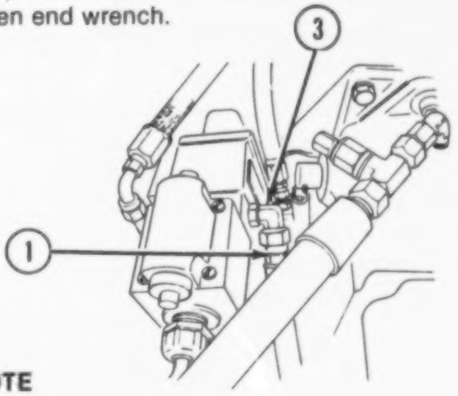
2. CONNECT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO SERVO ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 11/16 inch open end wrench.

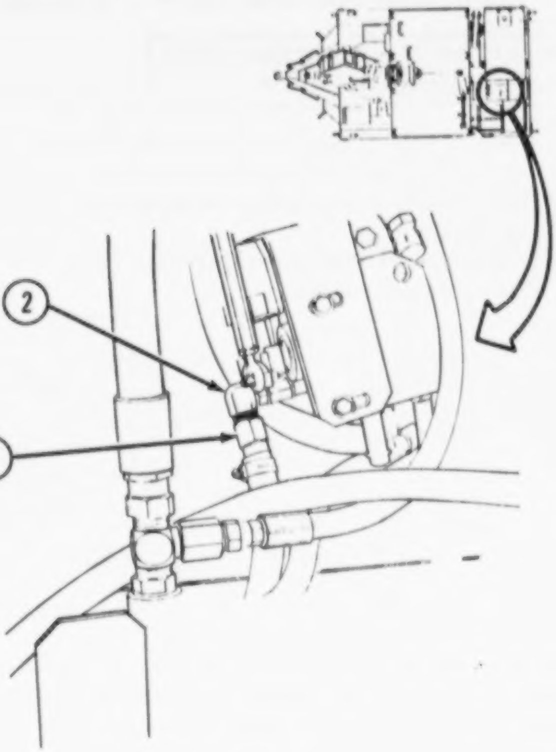


**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## E. MAGAZINE PUMP SUCTION HOSE ASSEMBLY REMOVAL



**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW.
   - Disconnect hose (1) from elbow (2). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap elbow.

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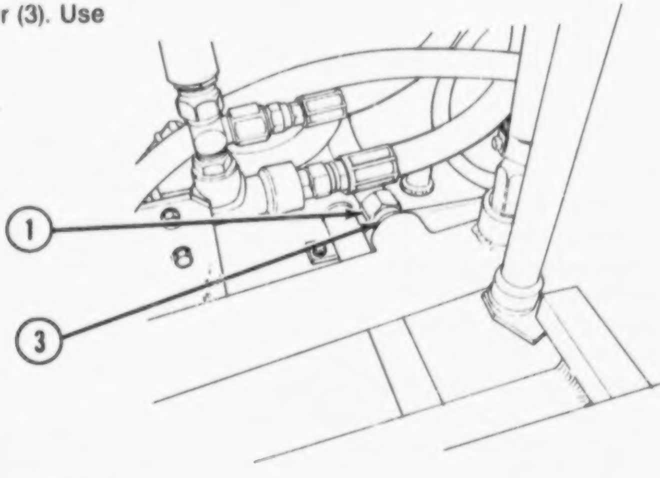
2. DISCONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SUCTION LINE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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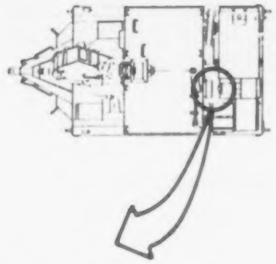
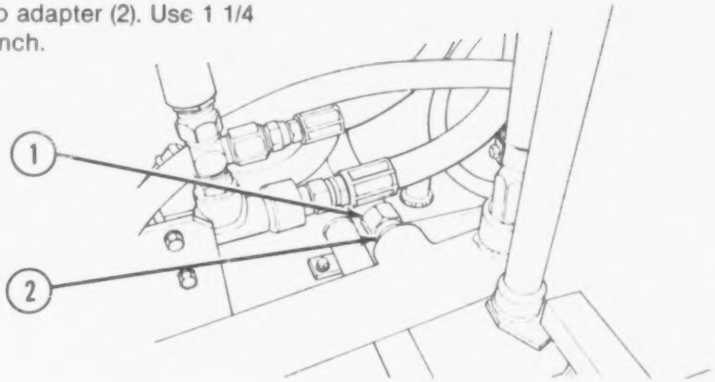
## 15-27 RIGHT MAGAZINE PUMP LINES — Continued



### F. MAGAZINE PUMP SUCTION HOSE ASSEMBLY INSTALLATION

1. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SUCTION LINE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 1 1/4 inch open end wrench.



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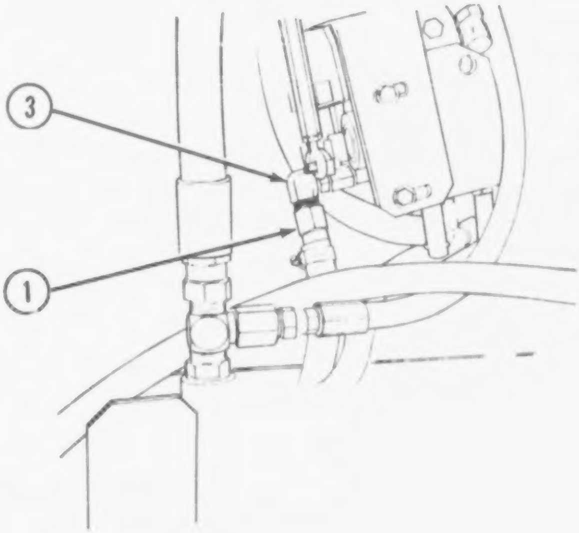
2. CONNECT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW.
   - Remove plug and cap from hose (1) and elbow (3).
   - Connect hose (1) to elbow (3). Use 1 1/4 inch open end wrench.

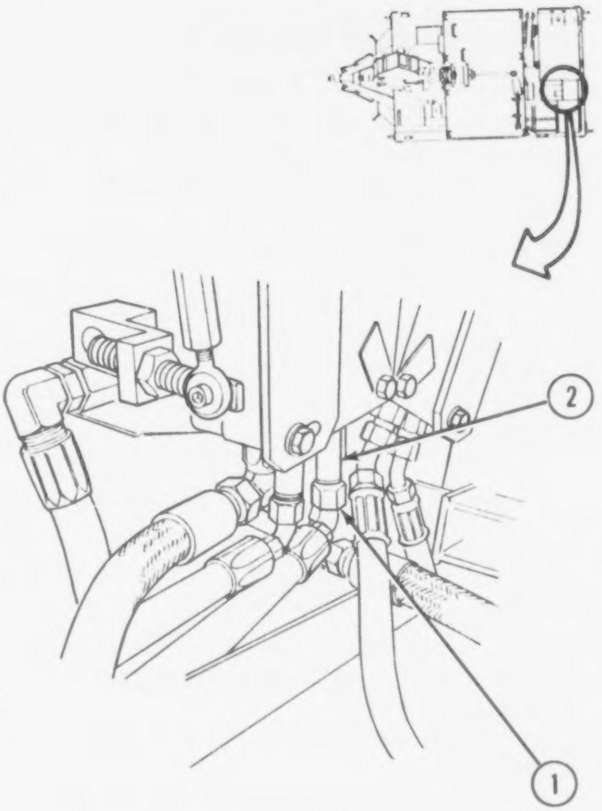


**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## G. FEED LINE A HOSE ASSEMBLY REMOVAL



NOTE

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.

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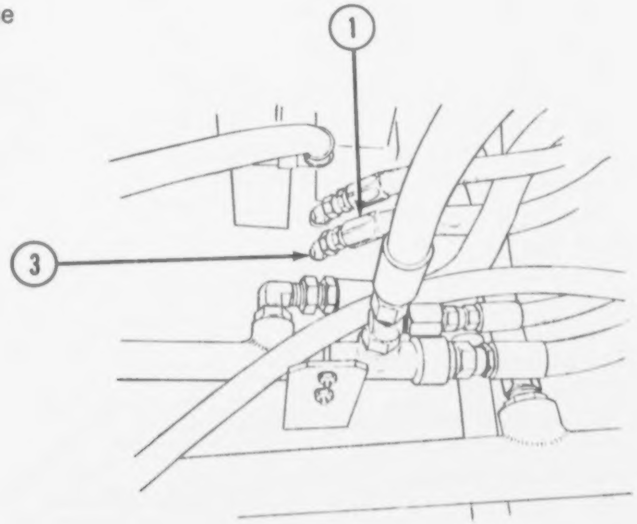
2. DISCONNECT FEED LINE A HOSE ASSEMBLY FROM BYPASS VALVE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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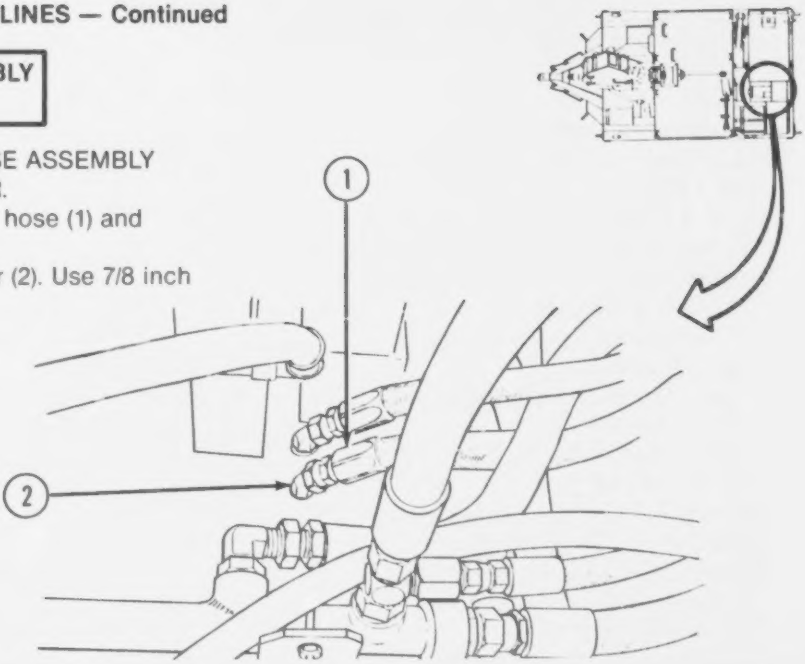
## 15-27 RIGHT MAGAZINE PUMP LINES — Continued

### H. FEED LINE A HOSE ASSEMBLY INSTALLATION

1. CONNECT FEED LINE A HOSE ASSEMBLY TO BYPASS VALVE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 7/8 inch open end wrench.



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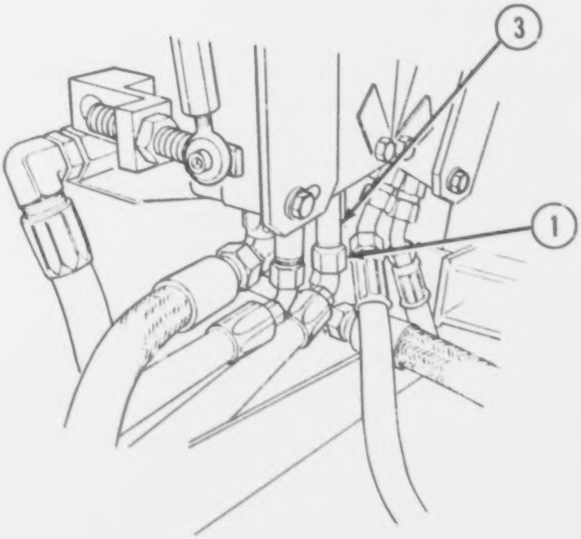
2. CONNECT FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (3).
   - Connect hose (1) to adapter (3). Use 7/8 inch open end wrench.

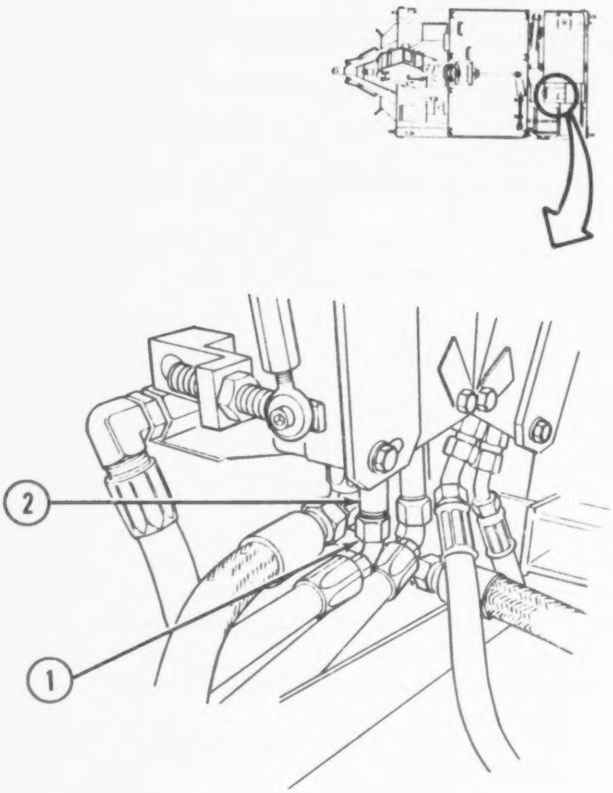


**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

## I. FEED LINE B HOSE ASSEMBLY REMOVAL



**NOTE**

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

1. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
   - Disconnect hose (1) from adapter (2). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.

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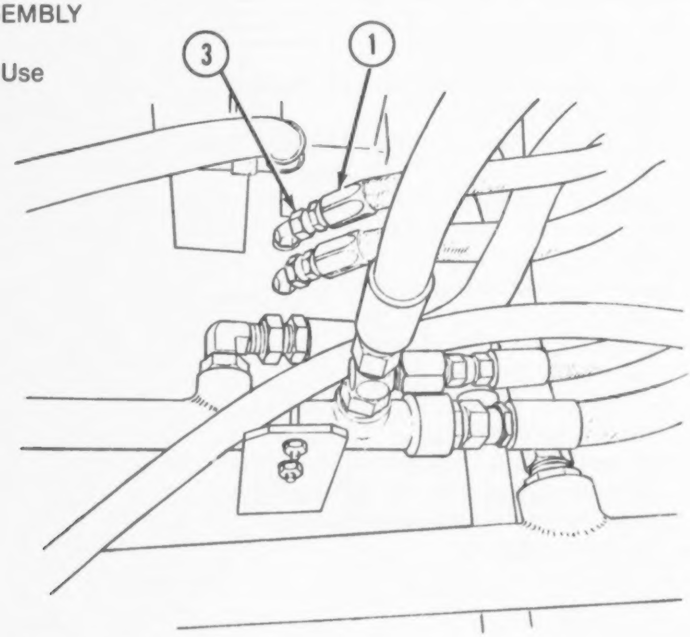
2. DISCONNECT FEED LINE B HOSE ASSEMBLY FROM BYPASS VALVE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 7/8 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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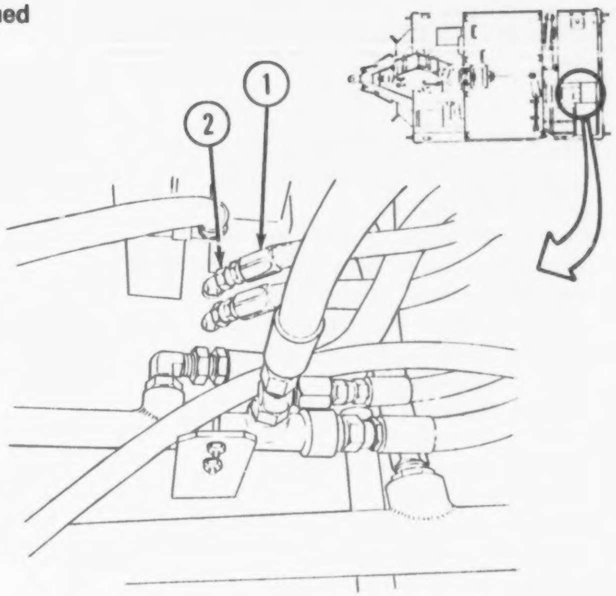
## 15-27 RIGHT MAGAZINE PUMP LINES — Continued

### J. FEED LINE B HOSE ASSEMBLY INSTALLATION

1. CONNECT FEED LINE B HOSE ASSEMBLY TO BYPASS VALVE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 7/8 inch open end wrench.



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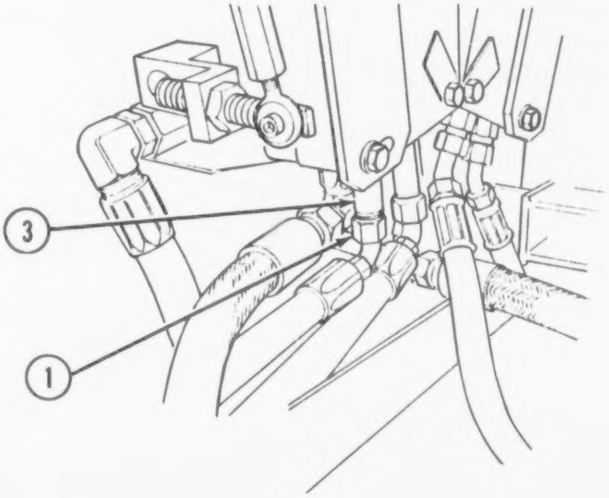
2. CONNECT FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
   - Remove plug and cap from hose (1) and adapter (3).
   - Connect hose (1) to adapter (3). Use 7/8 inch open end wrench.

NOTE

***FOLLOW-ON MAINTENANCE:***
Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service.(See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

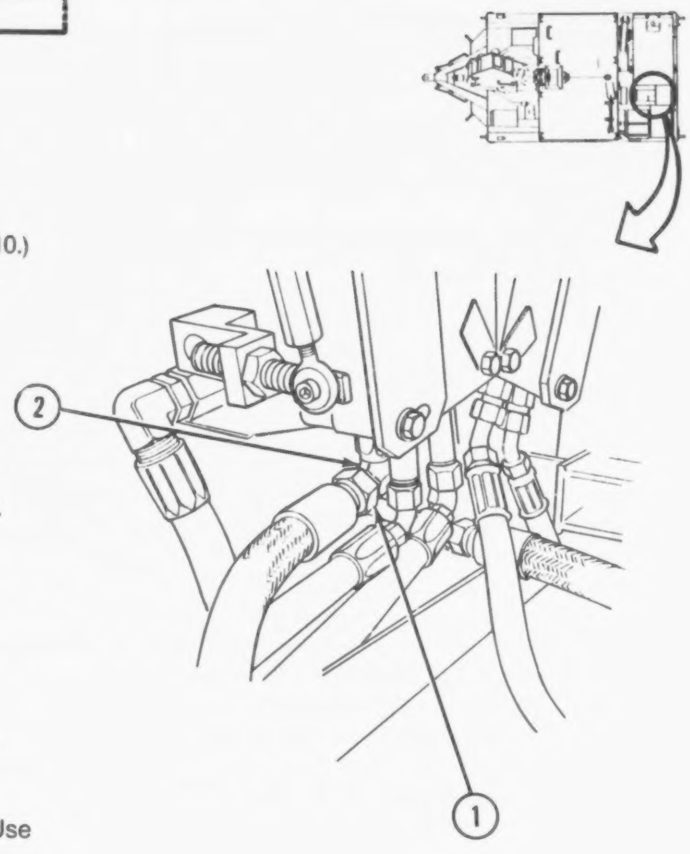


## K. MAGAZINE PUMP DRAIN HOSE ASSEMBLY REMOVAL

### NOTE

***PRELIMINARY PROCEDURES:***

Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)



1. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM PUMP TEE REDUCER.
   - Disconnect hose (1) from reducer (2). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap reducer.

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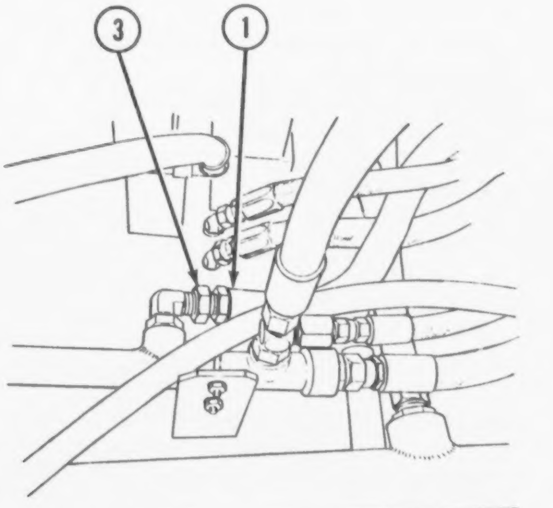
2. DISCONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM DRAIN LINE ADAPTER.
   - Disconnect hose (1) from adapter (3). Use 1 1/16 inch open end wrench.
   - Plug hose, and cap adapter.
   - Remove hose (1) from dispenser.



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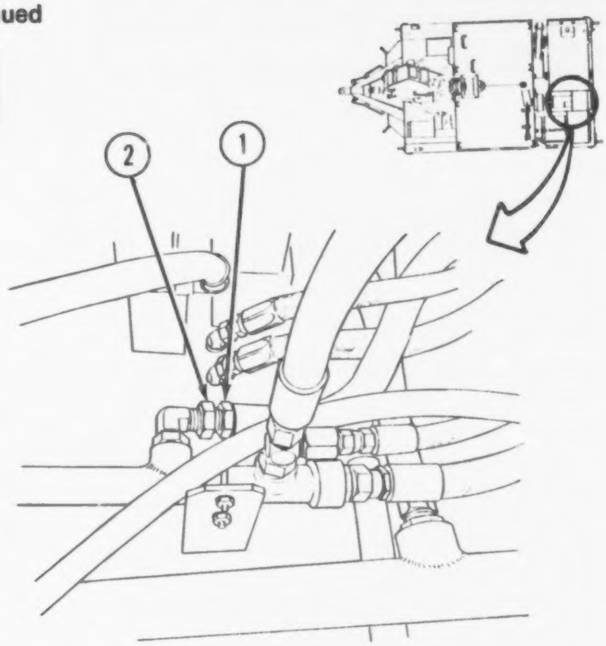
## 15-27 RIGHT MAGAZINE PUMP LINES — Continued

### L. MAGAZINE PUMP DRAIN HOSE ASSEMBLY INSTALLATION

1. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO DRAIN LINE ADAPTER.
   - Remove plug and cap from hose (1) and adapter (2).
   - Connect hose (1) to adapter (2). Use 1 1/16 inch open end wrench.



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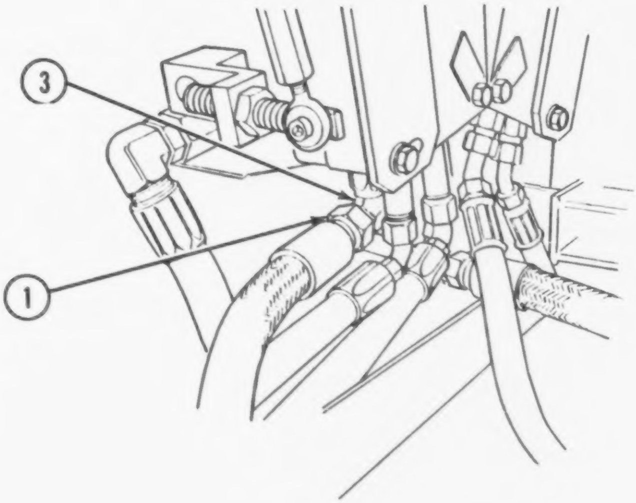
2. CONNECT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO PUMP TEE REDUCER.
   - Remove plug and cap from hose (1) and reducer (3).
   - Connect hose (1) to reducer (3). Use 1 1/16 inch open end wrench.

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

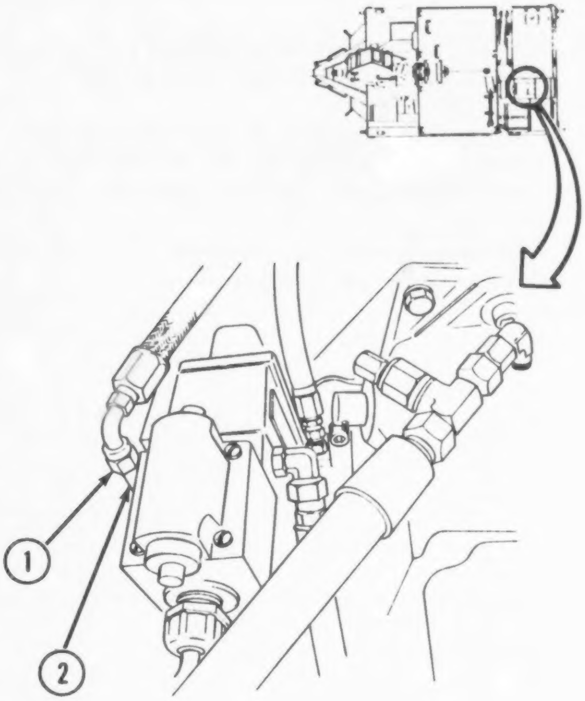


## M. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY REMOVAL

### NOTE

***PRELIMINARY PROCEDURES:***

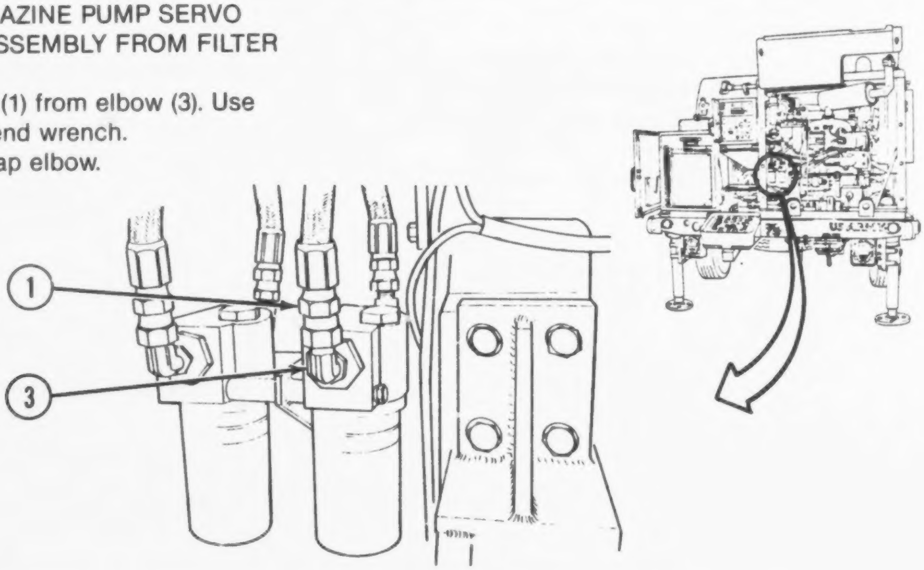
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)



1. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM SERVO ELBOW.
   - Disconnect hose (1) from elbow (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.

---

2. DISCONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY FROM FILTER ELBOW.
   - Disconnect hose (1) from elbow (3). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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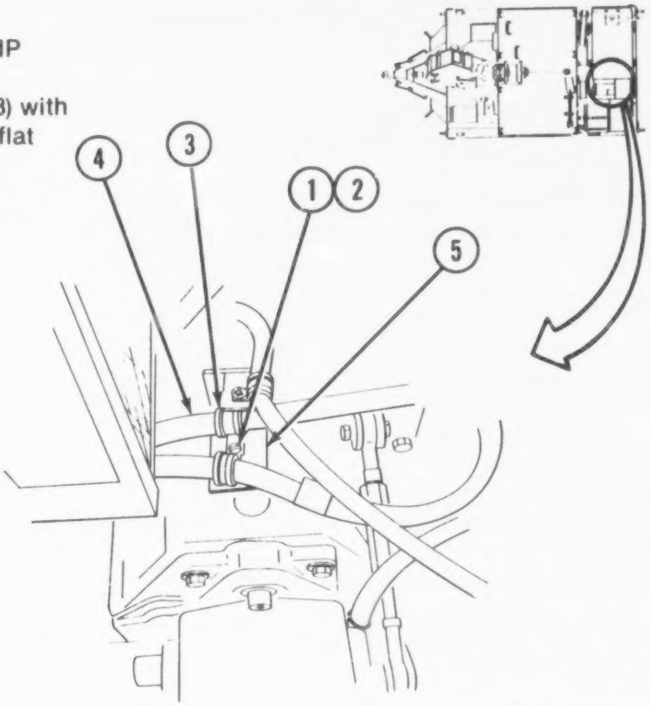
## M. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY REMOVAL — Continued

3. REMOVE MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY AND CLAMP FROM DISPENSER.
   - Remove nut (1), screw (2), and clamp (3) with hose (4) from bracket (5). Use 1/4 inch flat tip screwdriver and 3/8 inch open end wrench.
   - Remove clamp (3) from hose (4).
   - Remove hose (4) from dispenser.



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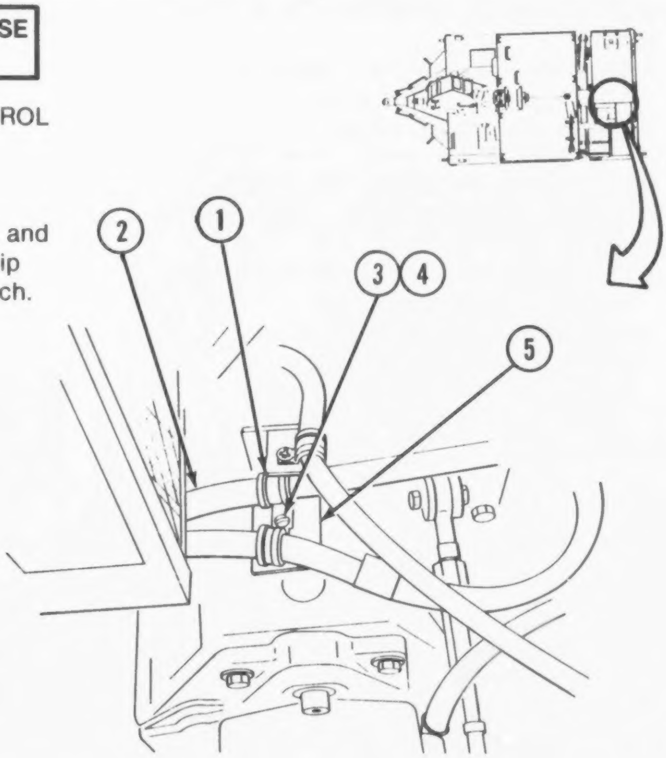
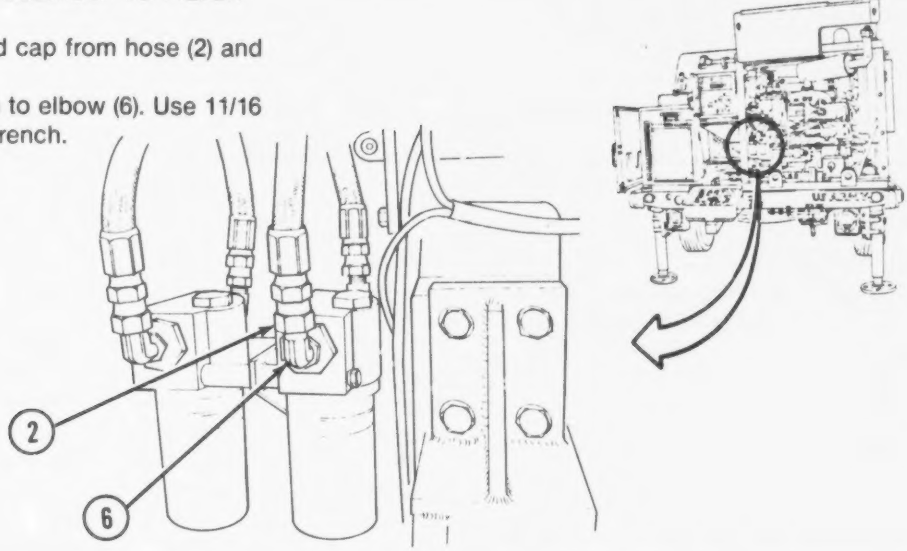
## N. MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY INSTALLATION

1. INSTALL MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY AND CLAMP ON DISPENSER.
   - Place clamp (1) on hose (2).
   - Install clamp (1) with hose (2), screw (3), and nut (4), on bracket (5). Use 1/4 inch flat tip screwdriver and 3/8 inch open end wrench.



2. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO FILTER ELBOW.
   - Remove plug and cap from hose (2) and elbow (6).
   - Connect hose (2) to elbow (6). Use 11/16 inch open end wrench.



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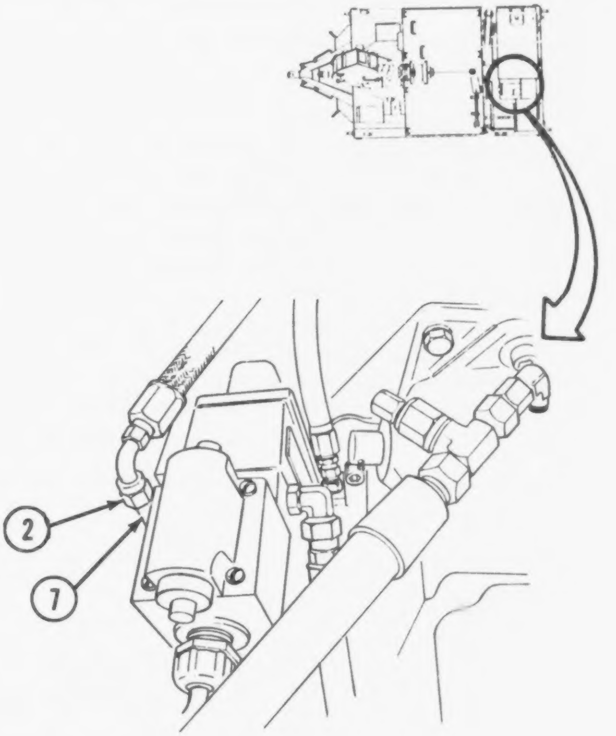
3. CONNECT MAGAZINE PUMP SERVO CONTROL HOSE ASSEMBLY TO SERVO ELBOW.
   - Remove plug and cap from hose (2) and elbow (7).
   - Connect hose (2) to elbow (7). Use 11/16 inch open end wrench.

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Put Cable In Storage Cabinet. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



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END OF TASK

## 15-28 MAGAZINE PUMPS LINKAGE ADJUSTMENT

### DESCRIPTION

This task covers: MAGAZINE PUMPS LINKAGE ADJUSTMENT (p 15-401)

### INITIAL SETUP

*Tools and Special Tools:*

General mechanic's tool kit
 5180-00-177-7033:
  5/8 inch open end wrench
  7/16 inch box end wrench
  3/4 inch open end wrench
  1/2 inch open end wrench
  3/8 inch flat tip screwdriver
  5/32 inch hex key
  15/16 inch open end wrench
  1/4 inch flat tip screwdriver
Stop watch 6645-00-250-4680

*Materials/Parts:*

Masking tape, Item 19, Appendix B
Self-locking nut 5310-00-088-1251

*Personnel Required:*

Mechanic
Helper

*References:*

TM 9-1095-205-10
TM 9-1095-205-20
LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, Page 15-307

### OVERVIEW

Magazine pumps linkage adjustment is a very critical task. Linkage adjustment includes adjustment of a turnbuckle, adjustable length lever, servo actuator, and mechanical stop. Each adjustment of turnbuckle, or adjustable length lever, or servo actuator will affect the other two adjustments. These other adjustments may then require adjustment. Failure to follow the magazine pumps linkage adjustment procedure to completion can cause accidental mine launch.

Left and right magazine pumps linkages are adjusted the same way. This procedure shows left magazine pump linkage adjustment. Nomenclature that differs in right magazine pump linkage adjustment is shown in brackets [ ]. Access for right magazine pump linkage adjustment requires removal of control box storage assembly and engine fixed panel. (See TM 9-1095-205-20.) If both left and right magazine pumps linkages are adjusted, two self-locking nuts are required.

### MAGAZINE PUMPS LINKAGE ADJUSTMENT

**NOTE**

***PRELIMINARY PROCEDURES:***

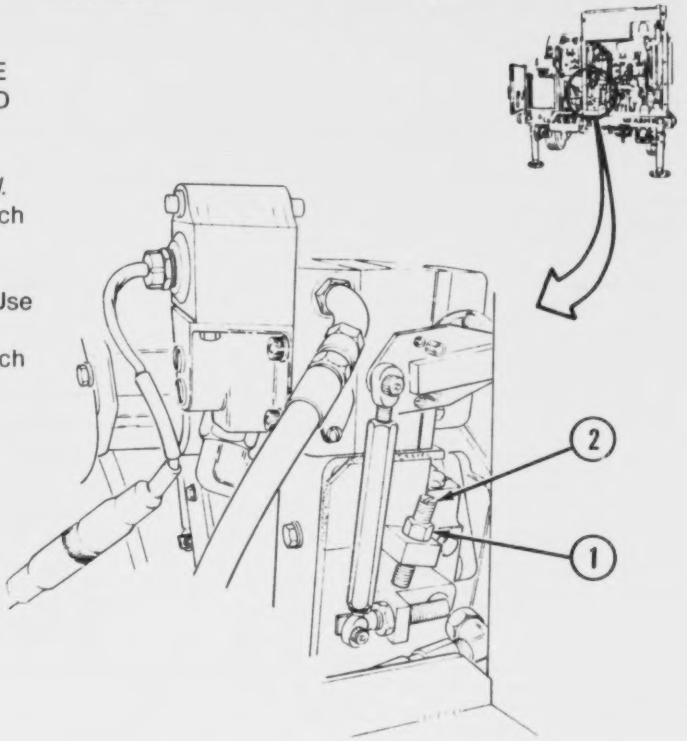
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Open Left Magazine Access Doors. (See TM 9-1095-205-10.)
Start Engine. (See TM 9-1095-205-10.)
Unload Left Magazine. (See TM 9-1095-205-10.)
Stop Engine. (See TM 9-1095-205-20.)

GO TO NEXT PAGE

## MAGAZINE PUMPS LINKAGE ADJUSTMENT — Continued

1. PERFORM LEFT MAGAZINE SERVO ACTUATOR OPERATIONAL CHECK. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

2. BACK OFF MECHANICAL STOP SCREW.
   - Loosen nut (1) on screw (2). Use 3/4 inch open end wrench and 3/8 inch flat tip screwdriver.
   - Back off screw (2) at least five turns. Use 3/8 inch flat tip screwdriver.
   - Tighten nut (1) on screw (2). Use 3/4 inch open end wrench and 3/8 inch flat tip screwdriver.



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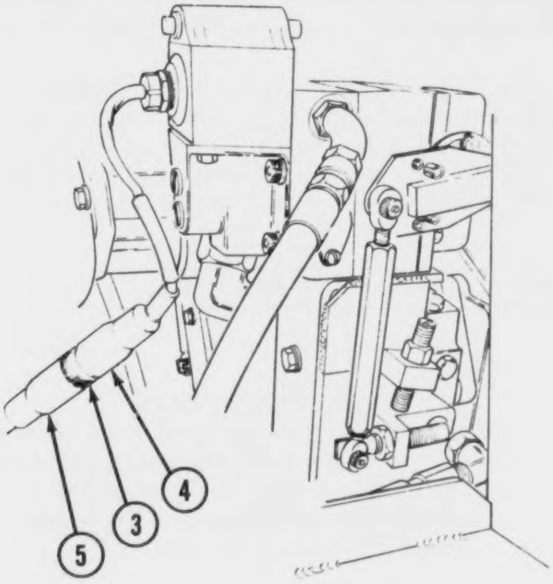
3. TURN CONNECTOR SLEEVE (3), AND DISCONNECT CONNECTOR P32 [P31] (4) FROM RECEPTACLE J32 [J31] (5).

4. START ENGINE. (SEE TM 9-1095-205-10.)

5. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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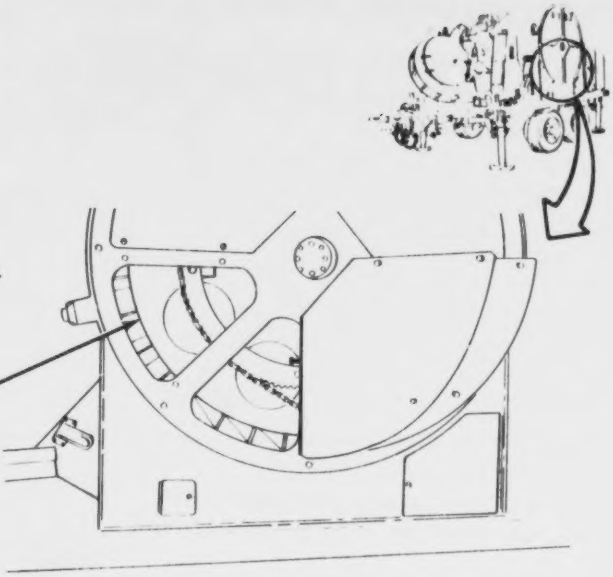
6. TEST LEFT MAGAZINE REEL FOR CREEP.
   - Lift and set MODE SELECT SWITCH on operator control box (OCB) to LOAD/UNLOAD. (See TM 9-1095-205-10.)
   - Lift and set LEFT MAGAZINE LOAD/OFF/UNLOAD switch on OCB to UNLOAD. (See TM 9-1095-205-10.)
   - Check reel (6) for creep.
   - If reel (6) does not creep, go to step 8.
   - If reel (6) creeps, adjust reel to stop creep. (See next step.)



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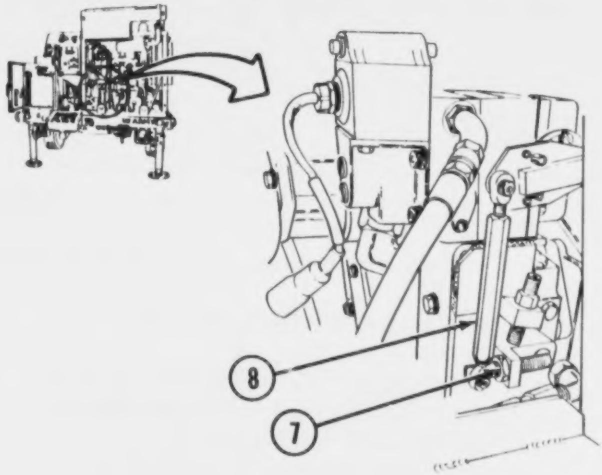
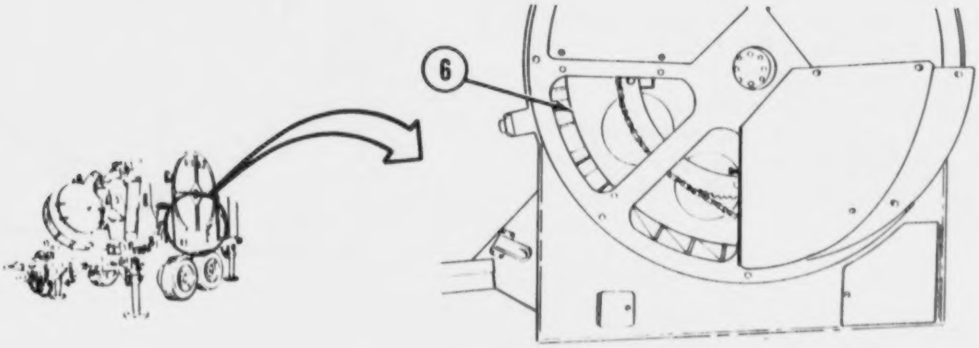
7. ADJUST LEFT MAGAZINE REEL TO STOP CREEP.
   - Loosen turnbuckle jam nut (7). Use 5/8 inch and 1/2 inch open end wrenches.
   - Turn turnbuckle (8) until reel (6) does not creep. Use 5/8 inch open end wrench. Use helper.
   - Tighten turnbuckle jam nut (7). Use 5/8 inch and 1/2 inch open end wrenches.

8. STOP ENGINE. (SEE TM 9-1095-205-20.)

9. SET LEFT MAGAZINE LOAD/OFF/UNLOAD SWITCH ON OCB TO OFF. (SEE TM 9-1095-205-10.)

10. SET MODE SELECT SWITCH ON OCB TO OFF. (See TM 9-1095-205-10.)





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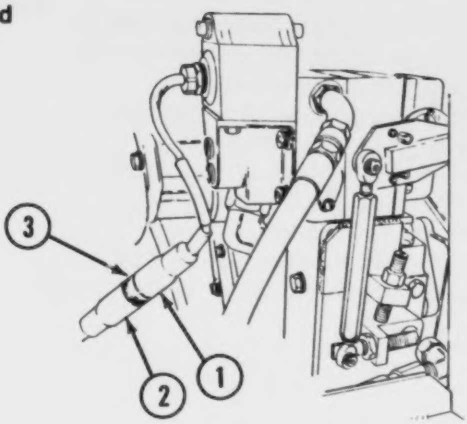
## MAGAZINE PUMPS LINKAGE ADJUSTMENT—Continued

11. CONNECT CONNECTOR P32 [P31] (1) TO RECEPTACLE J32 [J31] (2), AND TURN CONNECTOR SLEEVE (3).



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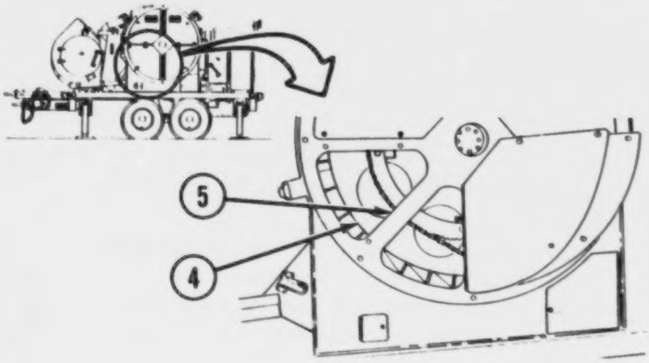
12. MARK LEFT MAGAZINE REEL.
    - Mark reel (4) parallel to magazine cover assembly cross bar (5). Use masking tape.

13. START ENGINE. (SEE TM 9-1095-205-10.)

14. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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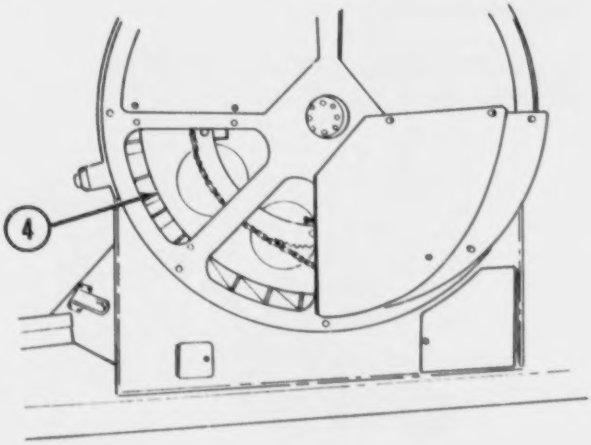
**NOTE**

Allow magazine to rotate at least five times before timing.

15. TIME LEFT MAGAZINE REEL SPEED IN UNLOAD MODE.
    - Lift and set MODE SELECT switch on OCB to LOAD/UNLOAD. (See TM 9-1095-205-10.)
    - Lift and set LEFT MAGAZINE LOAD/OFF/UNLOAD switch on OCB to UNLOAD. (See TM 9-1095-205-10.)
    - Measure and note time for one rotation of reel (4). Time should be 15 1/2 — 17 seconds. Use stop watch.
    - If time is correct, go to step 24.
    - If time is not correct, stop engine (see TM 9-1095-205-20), and adjust adjustable length lever extension screw. (See next step.)

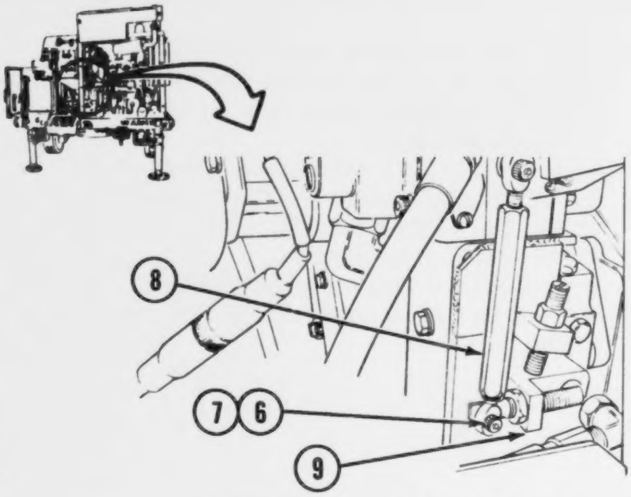


**NOTE**

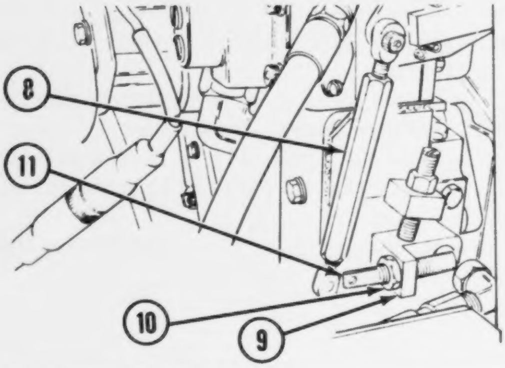
One-half turn (180°) on adjustable length lever extension screw will cause approximately 1/4 second change of magazine reel speed. Lengthen lever to increase reel speed. Shorten lever to decrease reel speed.

• • • •

Do not change length of turnbuckle.



16. ADJUST ADJUSTABLE LENGTH LEVER EXTENSION SCREW.
    - Remove self-locking nut (6), screw (7), and turnbuckle (8) from adjustable lever (9). Use 5/32 inch hex key and 7/16 inch box end wrench. Save self-locking nut.
    - Loosen jam nut (10) on extension screw (11). Use 15/16 inch open end wrench.
    - Turn extension screw (11) to lengthen or shorten lever (9) to adjust magazine reel speed to 15 1/2 — 17 seconds.
    - Tighten jam nut (10) on extension screw (11). Use 15/16 inch open end wrench.
    - Install turnbuckle (8), screw (7), and old self-locking nut (6) on adjustable lever (9). Use 5/32 inch hex key and 7/16 inch box end wrench.



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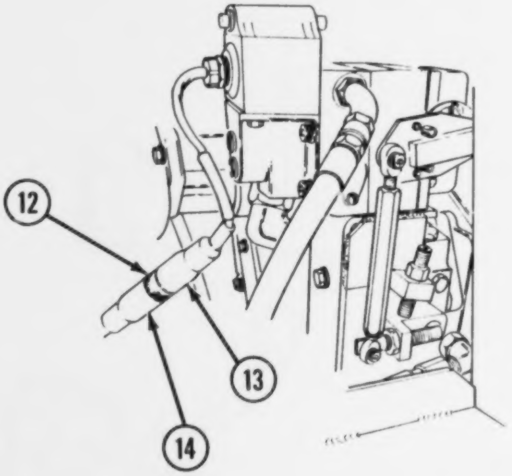
17. TURN CONNECTOR SLEEVE (12), AND DISCONNECT CONNECTOR P32 [P31] (13) FROM RECEPTACLE J32 [J31] (14).

18. START ENGINE. (SEE TM 9-1095-205-10.)

19. MOVE THROTTLE CONTROL HANDLE TO MAX. (SEE TM 9-1095-205-10.)



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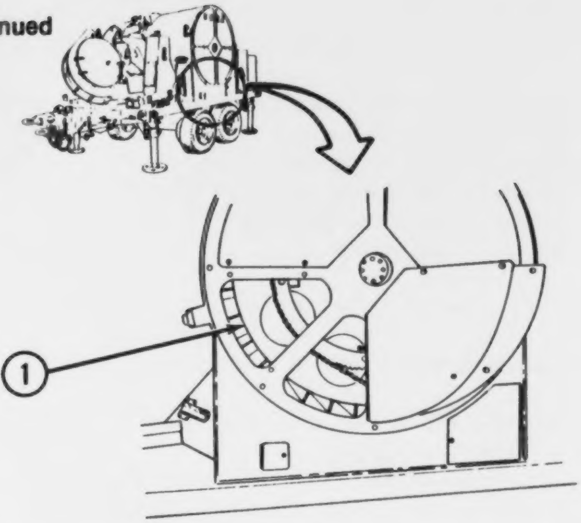
**MAGAZINE PUMPS LINKAGE ADJUSTMENT—Continued**

20. TEST LEFT MAGAZINE REEL FOR CREEP.
    - Lift and set MODE SELECT SWITCH on OCB to LOAD/UNLOAD. (See TM 9-1095-205-10.)
    - Lift and set LEFT MAGAZINE LOAD/OFF/UNLOAD switch on OCB to UNLOAD. (See TM 9-1095-205-10.)
    - Check reel (1) for creep.
    - If reel (1) does not creep, go to step 22.
    - If reel (1) creeps, adjust reel to stop creep. (See next step.)



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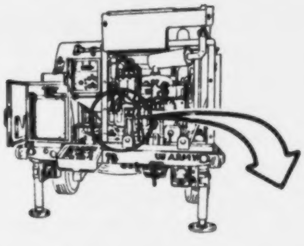
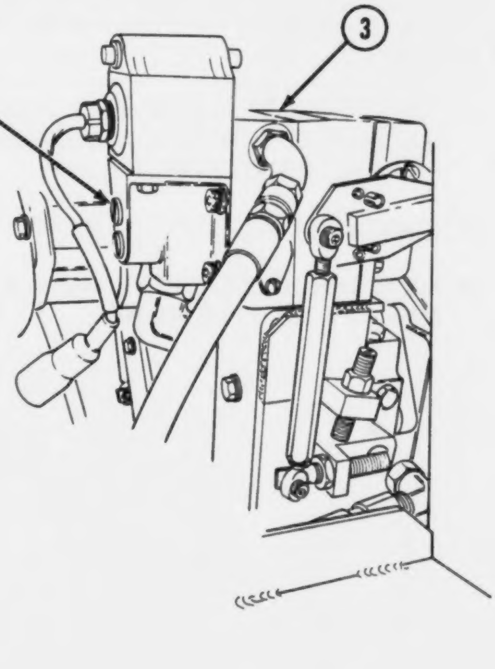
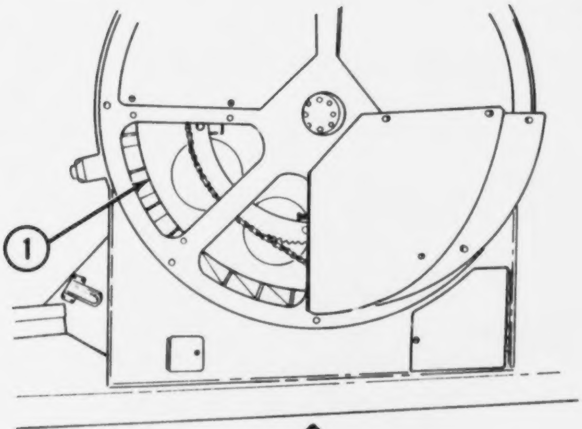
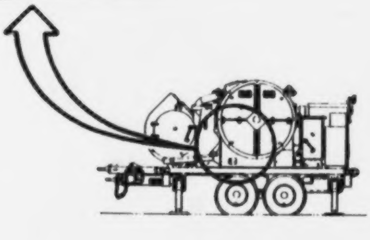
21. ADJUST LEFT MAGAZINE REEL TO STOP CREEP.
    - Remove cap (2) from servo actuator (3). Use 3/8 inch flat tip screwdriver.
    - Turn null screw (4) until reel (1) does not creep. Use 1/4 inch flat tip screwdriver. Use helper.
    - Install cap (2) on servo actuator (3). Use 3/8 inch flat tip screwdriver.



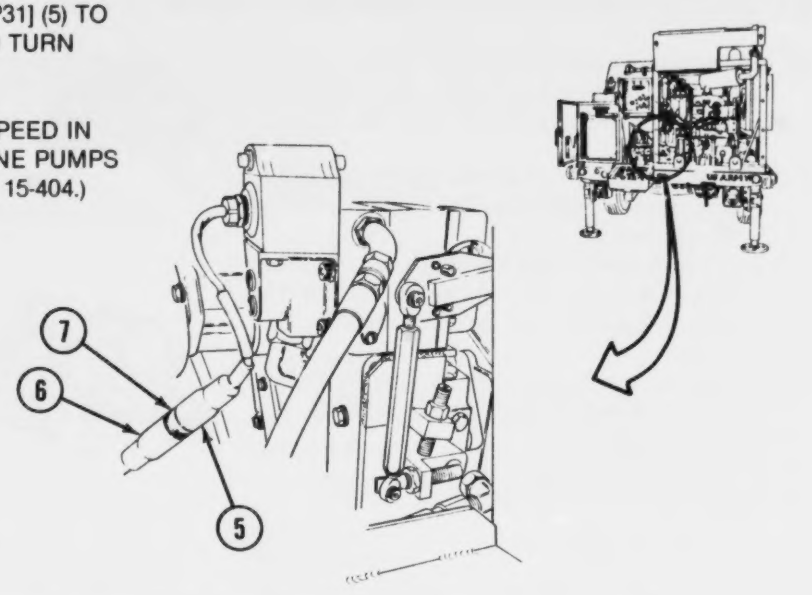






22. CONNECT CONNECTOR P32 [P31] (5) TO RECEPTACLE J32 [J31] (6), AND TURN CONNECTOR SLEEVE (7).

23. TIME LEFT MAGAZINE REEL SPEED IN UNLOAD MODE. (SEE MAGAZINE PUMPS LINKAGE ADJUSTMENT, PAGE 15-404.)



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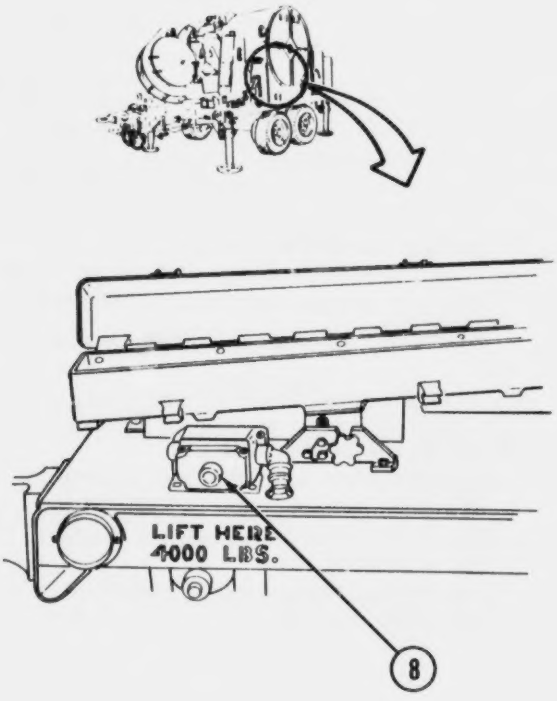
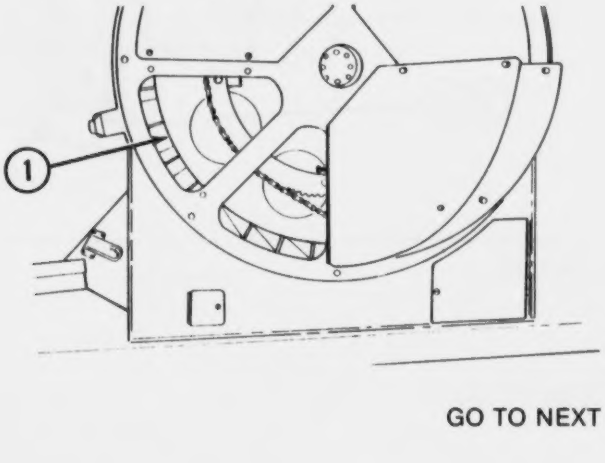
**NOTE**

Allow magazine reel to rotate at least five times before timing.

24. TIME LEFT MAGAZINE REEL SPEED IN LOAD ADVANCE MODE.
    - Lift and set MODE SELECT SWITCH on OCB to LOAD/UNLOAD. (See TM 9-1095-205-10.)
    - Lift and set LEFT MAGAZINE LOAD/OFF/UNLOAD switch on OCB to LOAD. (See TM 9-1095-205-10.)
    - Push left magazine LOAD ADVANCE/ UNLOAD button (8).
    - Measure and note time for one rotation of reel (1). Use stop watch.





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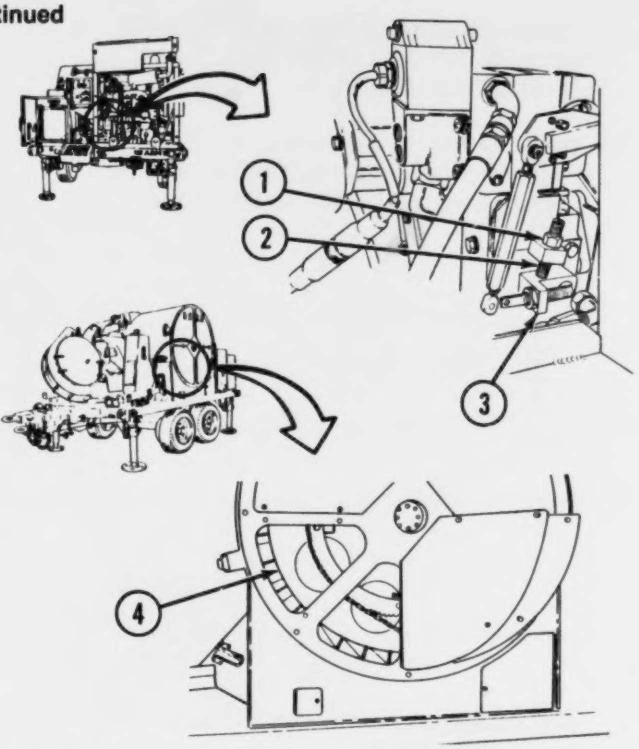
## MAGAZINE PUMPS LINKAGE ADJUSTMENT—Continued

25. SET MECHANICAL STOP.
    - Loosen nut (1) on screw (2). Use 3/4 inch open end wrench and 3/8 inch flat tip screwdriver.
    - Turn screw (2) until screw lightly contacts adjustable length lever (3). Use 3/8 inch flat tip screwdriver.
    - Adjust screw (2) until time for one rotation of reel (4) is 15 1/2 — 17 seconds. Use 3/8 inch screwdriver and stop watch. Use helper.
    - Tighten nut (1) on screw (2). Use 3/4 inch open end wrench and 3/8 inch flat tip screwdriver.

26. STOP ENGINE. (SEE TM 9-1095-205-20.)



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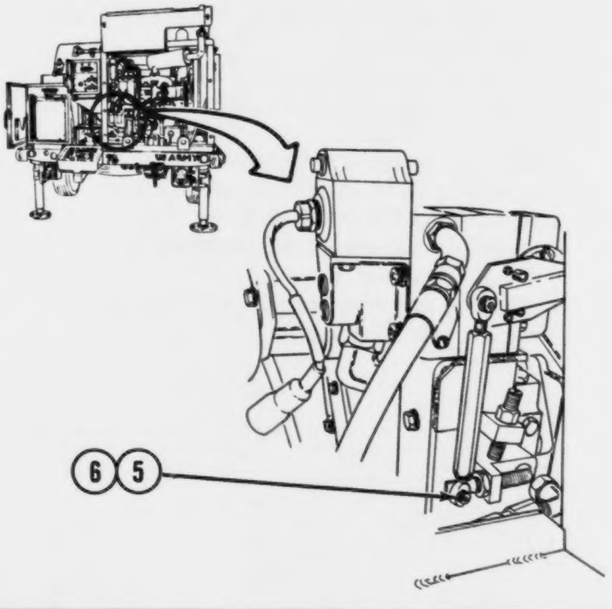
27. REPLACE ADJUSTABLE LENGTH LEVER SELF-LOCKING NUT.
    - Remove self-locking nut (5) from screw (6). Use 5/32 inch hex key and 7/16 inch box end wrench. Discard self-locking nut.
    - Install new self-locking nut (5) on screw (6). Use 5/32 inch hex key and 7/16 inch box end wrench.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

Close Left Magazine Access Doors. (See TM 9-1095-205-10.)

Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-29 SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-410)
B. INSTALLATION (p 15-414)

---

### INITIAL SETUP

***Tools and Special Tools:***

- General mechanic's tool kit
  - 5180-00-177-7033:
    - 11/16 inch open end wrench
    - Ratchet handle
    - 7/16 inch box end wrench
    - 5 inch extension
    - 3/4 inch socket
    - 6 inch adjustable wrench
    - 9/16 inch open end wrench
- 1 1/4 inch open end wrench 5120-00-277-2322
- Cap and plug set 5340-00-450-5718

***Materials/Parts:***

- Lock washer (4) 5310-00-582-5965
- Lock washer (2) 5310-00-003-4094
- Preformed packing (2) 5330-00-804-5695
- O-ring boss reducer (2) (19200) 9290934

***References:***

- TM 9-1095-205-10
- TM 9-1095-205-20

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

---

### OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Hydraulic lines have hydraulic fluid in them. Loosen hose couplings slowly. Catch hydraulic fluid with rags or in suitable container. Wipe up spilled hydraulic fluid. Dispose of drained fluid according to local procedures.

If you remove more than one hose assembly, tag and mark each one. Remove tags after hose assembly installation.

GO TO NEXT PAGE

## 15-29 SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET—Continued

### A. REMOVAL

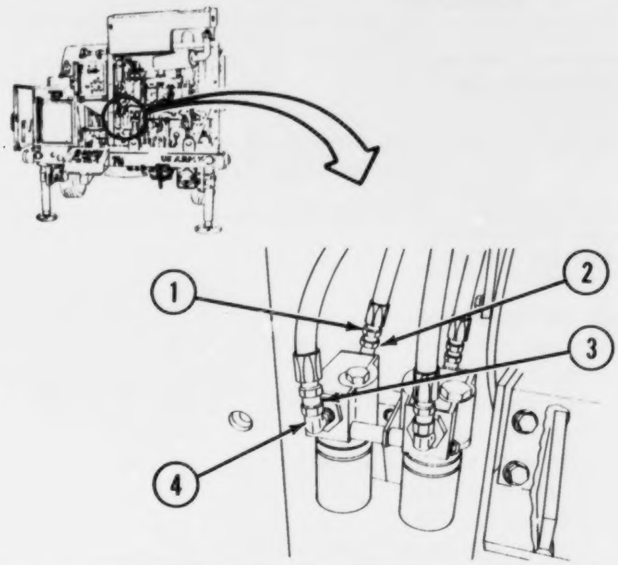
NOTE

***PRELIMINARY PROCEDURES:***

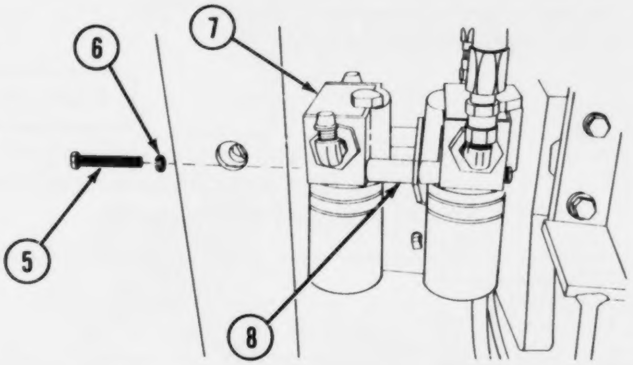
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)

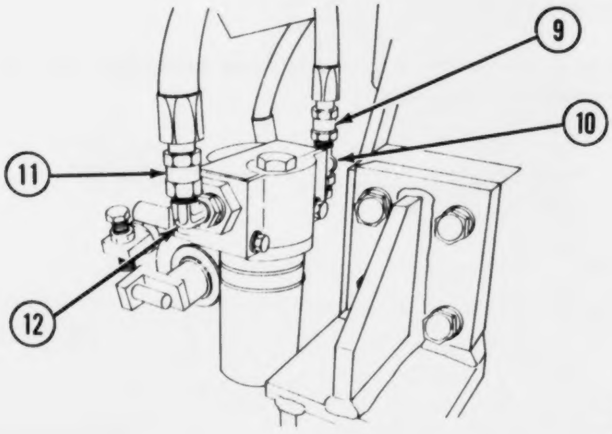
1. DISCONNECT TWO HOSES FROM LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Disconnect hose (1) from tee (2). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.
   - Disconnect hose (3) from elbow (4). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



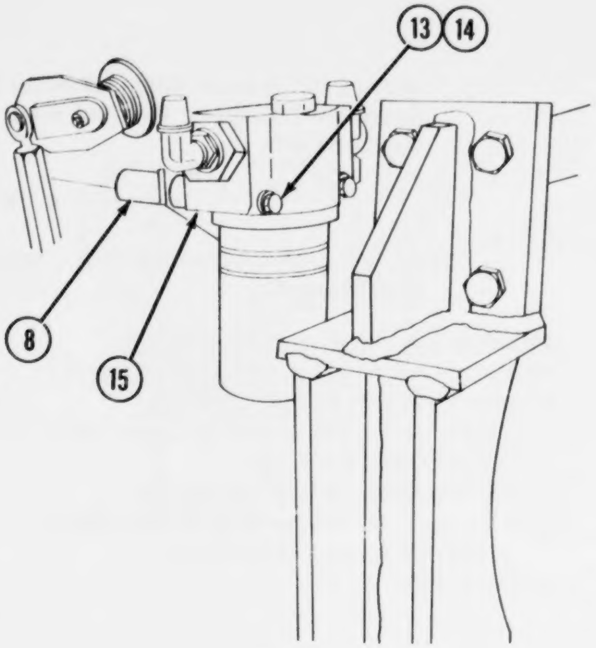
2. REMOVE LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY FROM FILTER BRACKET.
   - Remove two screws (5), lock washers (6), and filter (7) from bracket (8). Use 7/16 inch box end wrench. Discard lock washers.



3. DISCONNECT TWO HOSES FROM RIGHT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Disconnect hose (9) from tee (10). Use 11/16 inch open end wrench.
   - Plug hose, and cap tee.
   - Disconnect hose (11) from elbow (12). Use 11/16 inch open end wrench.
   - Plug hose and cap elbow.



4. REMOVE RIGHT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY FROM FILTER BRACKET.
   - Remove two screws (13), lock washers (14), and filter (15) from bracket (8). Use 7/16 inch box end wrench. Discard lock washers.



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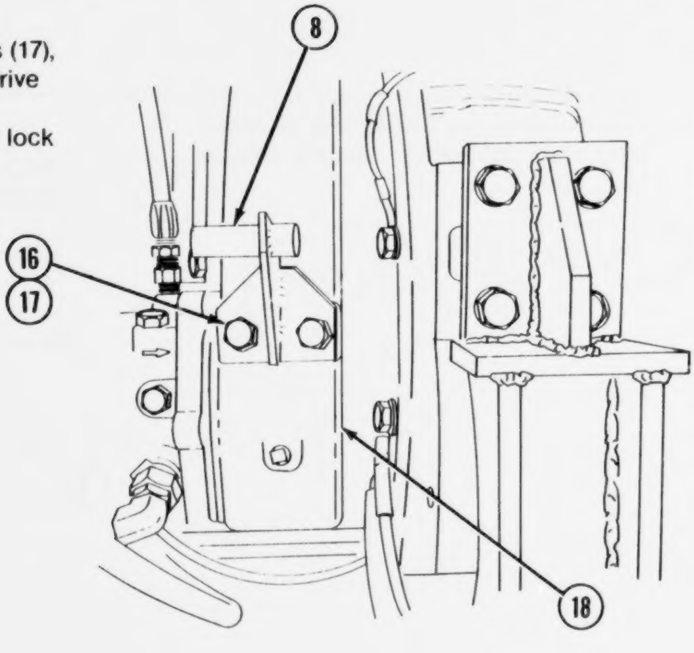
5. REMOVE FILTER BRACKET FROM HYDRAULIC PUMP DRIVE ASSEMBLY.
   - Remove two screws (16), lock washers (17), and bracket (8) from hydraulic pump drive (18). Use 3/4 inch socket with 5 inch extension and ratchet handle. Discard lock washers.



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### A. REMOVAL — Continued

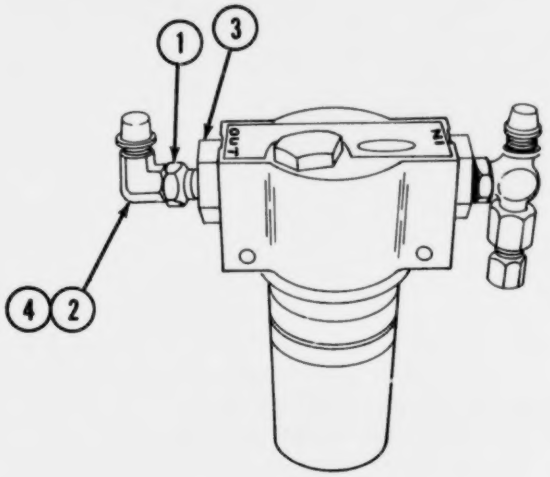
**NOTE**

Steps 6 thru 8 show fittings removal for the left servo actuator filter assembly. Fittings for the right servo actuator filter assembly are removed the same way.

• • • •

Do not remove elbow and O-ring boss reducer unless required for maintenance.

6. REMOVE ELBOW AND O-RING BOSS REDUCER FROM LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Loosen nut (1). Use 11/16 inch and 1 1/4 inch open end wrenches.
   - Remove elbow (2) from reducer (3).
   - Remove preformed packing (4) from elbow (2). Discard preformed packing.
   - Cap elbow.



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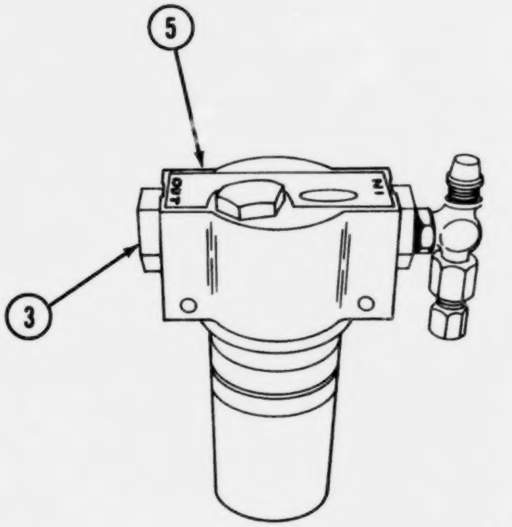
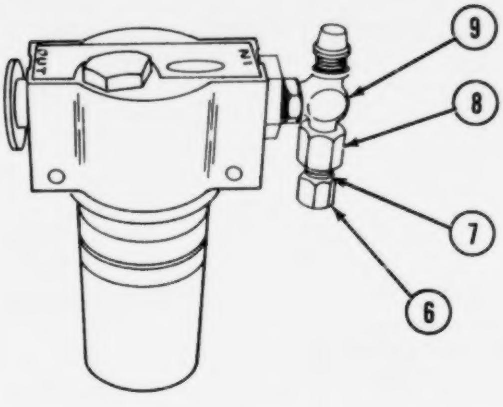
- Remove reducer (3) from filter (5). Use 1 1/4 inch open end wrench. Discard reducer.
- Plug filter.



**NOTE**

Do not remove cap and nut with 37° tube reducer unless required for maintenance.

7. REMOVE CAP AND NUT WITH 37° TUBE REDUCER FROM TEE.
   - Remove cap (6) from reducer (7). Use 9/16 inch and 11/16 inch open end wrenches.
   - Plug cap.
   - Remove nut (8) with reducer (7) from tee (9). Use 11/16 inch open end and 6 inch adjustable wrenches.
   - Cap tee.



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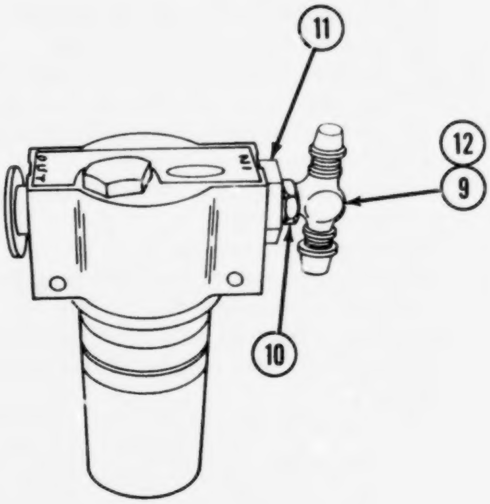
**NOTE**

Do not remove tee and O-ring boss reducer unless required for maintenance.

8. REMOVE TEE AND O-RING BOSS REDUCER FROM LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Loosen nut (10). Use 11/16 inch and 1 1/4 inch open end wrenches.
   - Remove tee (9) from reducer (11).
   - Remove preformed packing (12) from tee (9). Discard preformed packing.
   - Cap tee.



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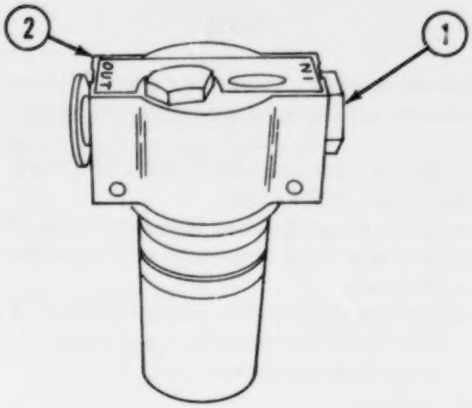
## A. REMOVAL — Continued

- Remove reducer (1) from filter (2). Use 1 1/4 inch open end wrench. Discard reducer.
- Plug filter.



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## B. INSTALLATION

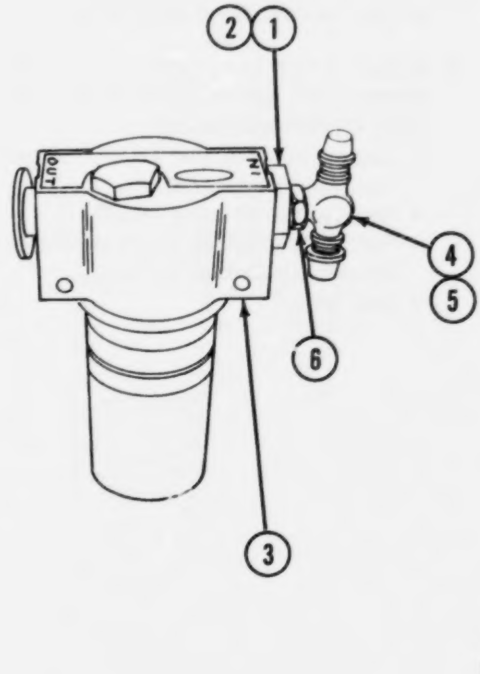
### NOTE

Steps 1 thru 3 show fittings installation for the right servo actuator filter assembly. Fittings for the left servo actuator filter assembly are installed the same way.

• • • •

If tee and O-ring boss reducer were not removed, go to step 2.

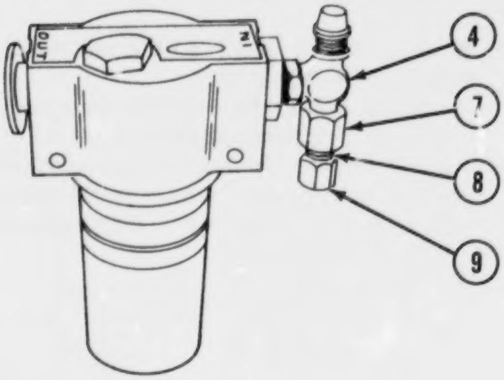
1. INSTALL NEW O-RING BOSS REDUCER AND TEE ON LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Apply light coat of hydraulic fluid to preformed packing (1) on new reducer (2).
   - Remove plug from filter (3).
   - Install reducer (2) on filter (3). Use 1 1/4 inch open end wrench.
   - Remove cap from tee (4).
   - Apply light coat of hydraulic fluid to new preformed packing (5).
   - Install preformed packing (5) on tee (4).
   - Install tee (5) on reducer (2). Do not tighten nut (6).



**NOTE**

If cap and nut with 37° reducer were not removed, go to step 3.

2. INSTALL NUT WITH 37° TUBE REDUCER AND CAP ON TEE.
   - Remove cap from tee (4).
   - Install nut (7) with reducer (8) on tee (4). Use 11/16 inch open end and 6 inch adjustable wrenches.
   - Remove plug from cap (9).
   - Install cap (9) on reducer (8). Use 9/16 inch and 11/16 inch open end wrenches.



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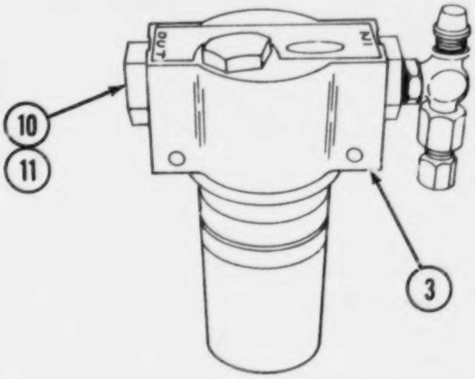
**NOTE**

If elbow and O-ring boss reducer were not removed, go to step 4.

3. INSTALL NEW O-RING BOSS REDUCER AND ELBOW ON LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Apply light coat of hydraulic fluid to preformed packing (10) on new reducer (11).
   - Remove plug from filter (3).
   - Install reducer (11) on filter (3). Use 1 1/4 inch open end wrench.



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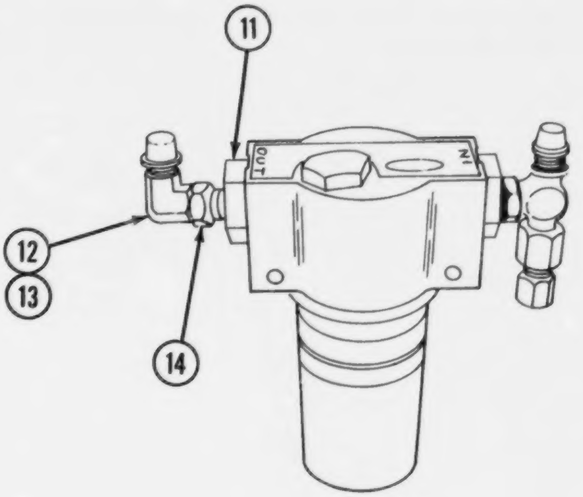
- Remove cap from elbow (12).
- Apply light coat of hydraulic fluid to new preformed packing (13).
- Install preformed packing (13) on elbow (12).
- Install elbow (12) on reducer (11), with elbow pointing up. Do not tighten nut (14).



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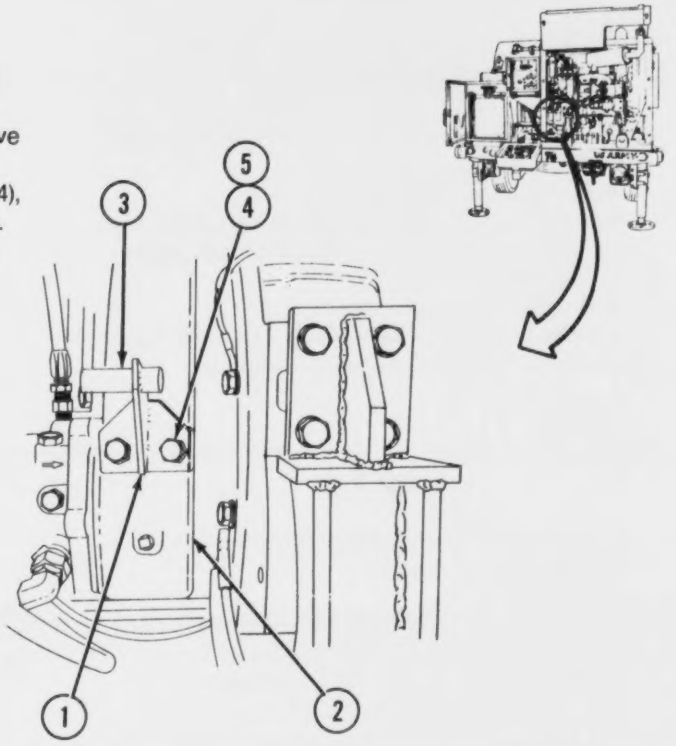
**B. INSTALLATION — Continued**

4. INSTALL FILTER BRACKET ON HYDRAULIC PUMP DRIVE ASSEMBLY.
   - Position bracket (1) on hydraulic pump drive (2), with long standoff (3) to left.
   - Install bracket (1), two new lock washers (4), and screws (5) on hydraulic pump drive (2). Use 3/4 inch socket with 5 inch extension and ratchet handle.



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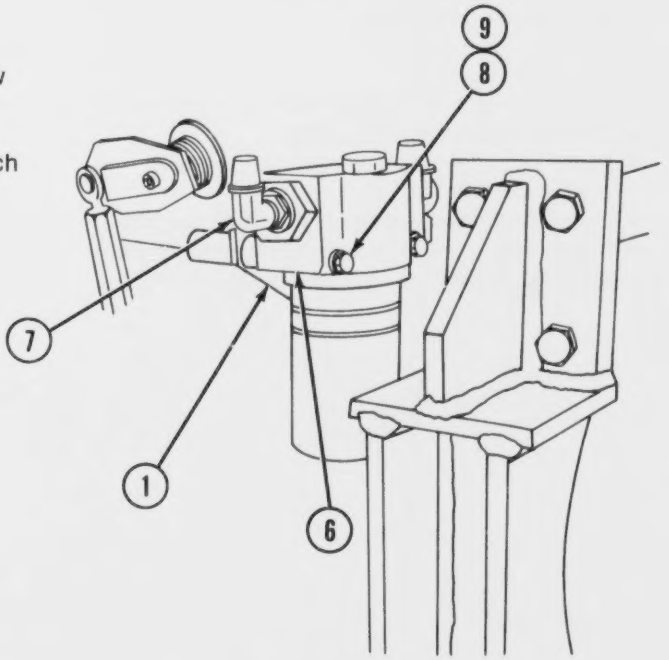
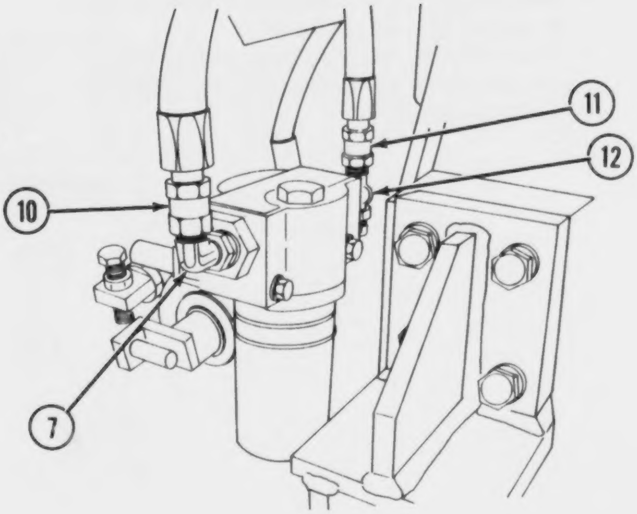
5. INSTALL RIGHT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY ON FILTER BRACKET.
   - Position filter (6) on bracket (1) with elbow (7) toward rear of dispenser.
   - Install filter (6), two new lock washers (8), and screws (9) on bracket (1). Use 7/16 inch box end wrench.



6. CONNECT TWO HOSES TO RIGHT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Remove plug and cap from hose (10) and elbow (7).
   - Connect hose (10) to elbow (7). Use 11/16 inch open end wrench.
   - Remove plug and cap from hose (11) and tee (12).
   - Connect hose (11) to tee (12). Use 11/16 inch open end wrench.



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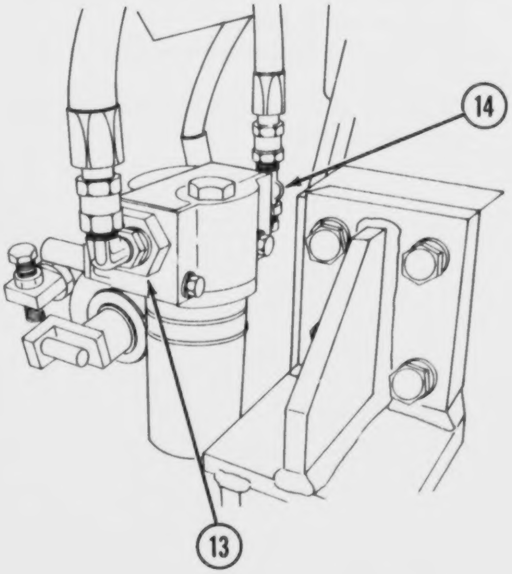
- Tighten nut (13). Use 11/16 inch open end wrench.
- Tighten nut (14). Use 11/16 inch open end wrench.



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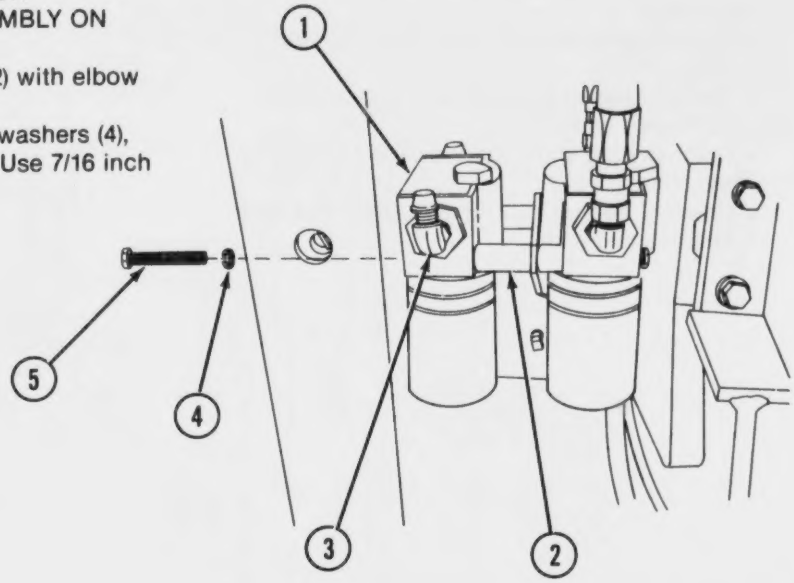
**B. INSTALLATION — Continued**

7. INSTALL LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY ON FILTER BRACKET.
   - Position filter (1) on bracket (2) with elbow (3) toward rear of dispenser.
   - Install filter (1), two new lock washers (4), and screws (5) on bracket (2). Use 7/16 inch box end wrench.



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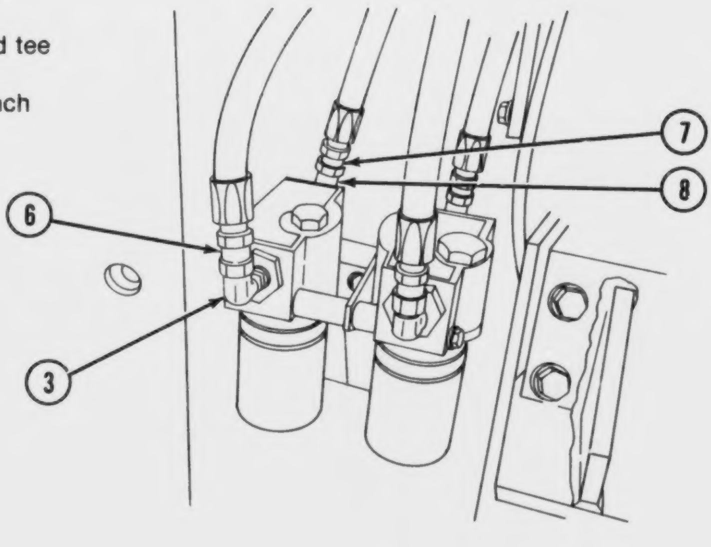
8. CONNECT TWO HOSES TO LEFT SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLY.
   - Remove plug and cap from hose (6) and elbow (3).
   - Connect hose (6) to elbow (3). Use 11/16 inch open end wrench.
   - Remove plug and cap from hose (7) and tee (8).
   - Connect hose (7) to tee (8). Use 11/16 inch open end wrench.

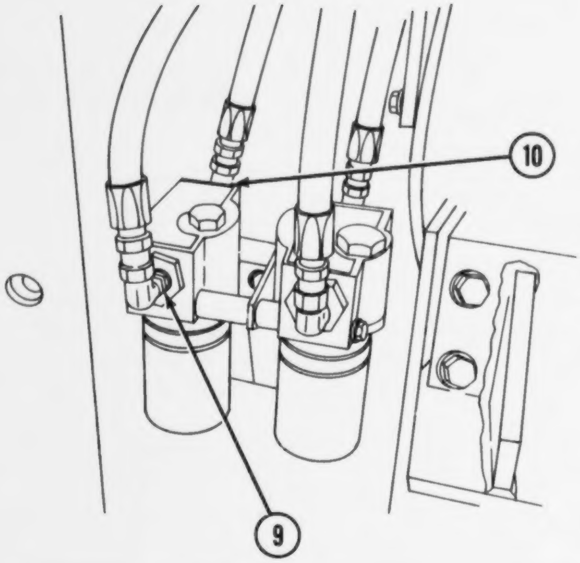


- Tighten nut (9). Use 11/16 inch open end wrench.
- Tighten nut (10). Use 11/16 inch open end wrench.

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Fill Hydraulic Reservoir. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)



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END OF TASK

## 15-30 RADIATOR AND DRAIN COCK FITTINGS

### DESCRIPTION

This task covers:
- A. DRAIN COCK FITTINGS REMOVAL (p 15-421)
- B. DRAIN COCK FITTINGS INSTALLATION (p 15-422)
- C. RADIATOR REMOVAL (p 15-423)
- D. RADIATOR INSTALLATION (p 15-425)

### INITIAL SETUP

***Tools and Special Tools:***
General mechanic's tool kit
 5180-00-177-7033:
  Ratchet handle
  5 inch extension
  9/16 inch socket
  9/16 inch box end wrench
  1/4 inch flat tip screwdriver
  6 inch adjustable wrench
Pipe wrench 5120-00-277-1461

***Materials/Parts:***
Sealing compound, Item 25, Appendix B
Lock washer (8) 5310-00-637-9541
Short nipple 4730-00-193-2709

***Personnel Required:***
Mechanic
Helper

***References:***
TM 9-1095-205-10
TM 9-1095-205-20
LOUVER ASSEMBLY, Page 15-431

### A. DRAIN COCK FITTINGS REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Radiator Drain Cock. (See TM 9-1095-205-20.)

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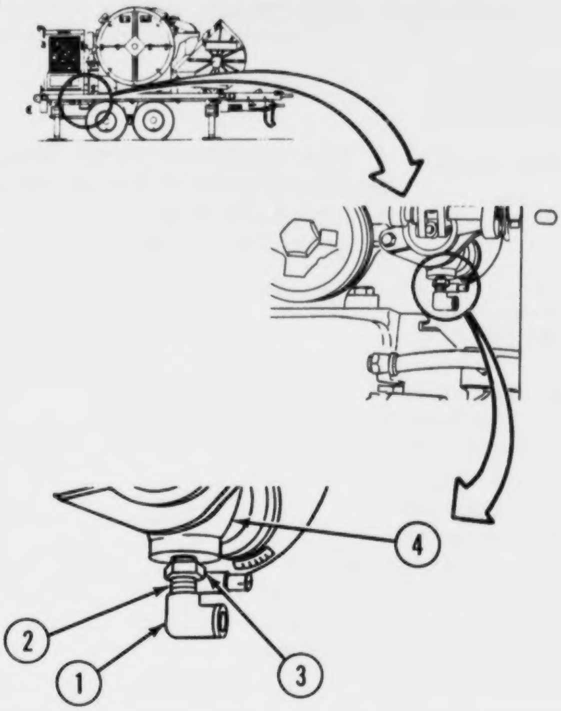
## A. DRAIN COCK FITTINGS REMOVAL — Continued



**NOTE**

Short nipple may remain in elbow or in bushing.

REMOVE DRAIN COCK FITTINGS FROM CONTROL ASSEMBLY HOUSING.

- Remove elbow (1) from short nipple (2). Use 6 inch adjustable wrench.
- If nipple (2) remained in elbow (1), remove nipple from elbow. Use 6 inch adjustable wrench and pipe wrench. Discard nipple.
- Remove bushing (3) from housing (4). Use 6 inch adjustable wrench.
- If nipple (2) remained in bushing (3), remove nipple from bushing. Use 6 inch adjustable wrench and pipe wrench. Discard nipple.

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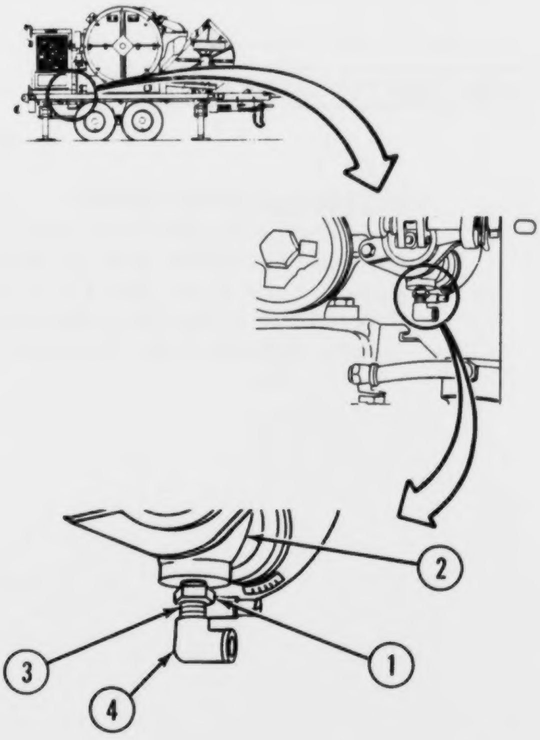
## B. DRAIN COCK FITTINGS INSTALLATION



1. INSTALL DRAIN COCK FITTINGS ON CONTROL ASSEMBLY HOUSING.
   - Apply sealing compound to threads of bushing (1).
   - Install bushing (1) on housing (2). Use 6 inch adjustable wrench.
   - Apply sealing compound to threads of new nipple (3).
   - Install nipple (3) on bushing (2). Use pipe wrench.
   - Install elbow (4) on nipple (3). Use 6 inch adjustable wrench.

2. INSTALL DRAIN COCK ON CONTROL ASSEMBLY AND HOUSING. (SEE TM 9-1095-205-20.)

3. FILL RADIATOR. (SEE TM 9-1095-205-20.)

4. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

5. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

---

## C. RADIATOR REMOVAL

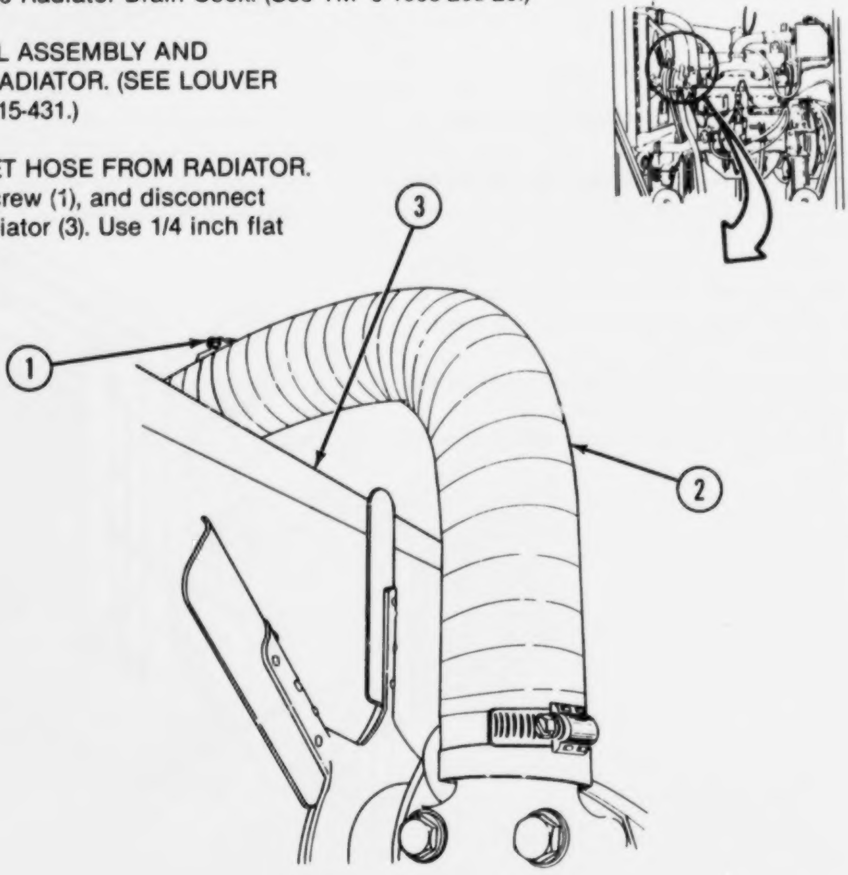
**NOTE**

***PRELIMINARY PROCEDURES:***

Drain Radiator. (See TM 9-1095-205-20.)
Remove Engine Hinged Panel. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Fan. (See TM 9-1095-205-20.)
Remove Radiator Drain Cock. (See TM 9-1095-205-20.)

1. REMOVE CONTROL ASSEMBLY AND HOUSING FROM RADIATOR. (SEE LOUVER ASSEMBLY, PAGE 15-431.)

2. DISCONNECT INLET HOSE FROM RADIATOR.
   - Loosen clamp screw (1), and disconnect hose (2) from radiator (3). Use 1/4 inch flat tip screwdriver.



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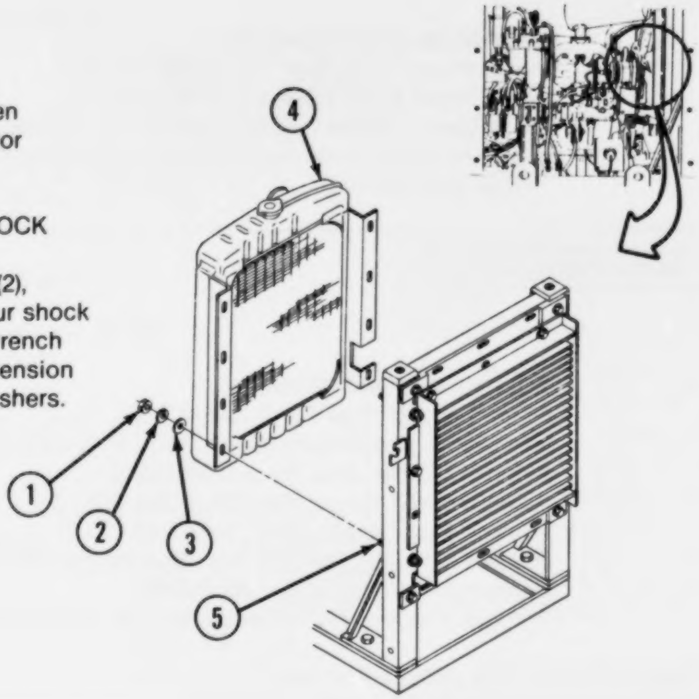
## C. RADIATOR REMOVAL — Continued

**CAUTION**

Radiator can fall and be damaged when last two nuts are removed. Hold radiator when removing last two nuts.

3. REMOVE RADIATOR FROM FOUR SHOCK MOUNTS.
   - Remove four nuts (1), lock washers (2), washers (3), and radiator (4) from four shock mounts (5). Use 9/16 inch box end wrench and 9/16 inch socket with 5 inch extension and ratchet handle. Discard lock washers.



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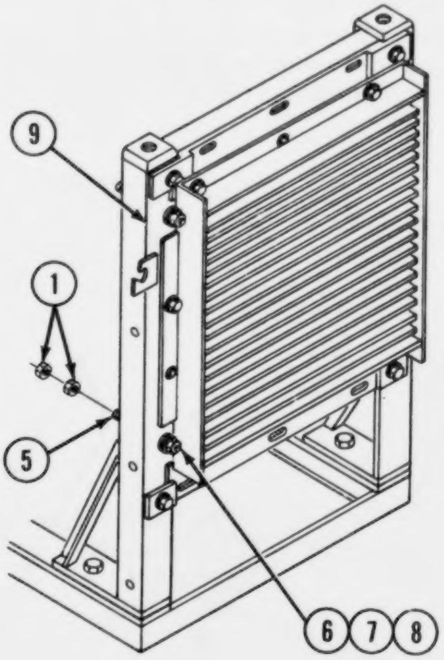
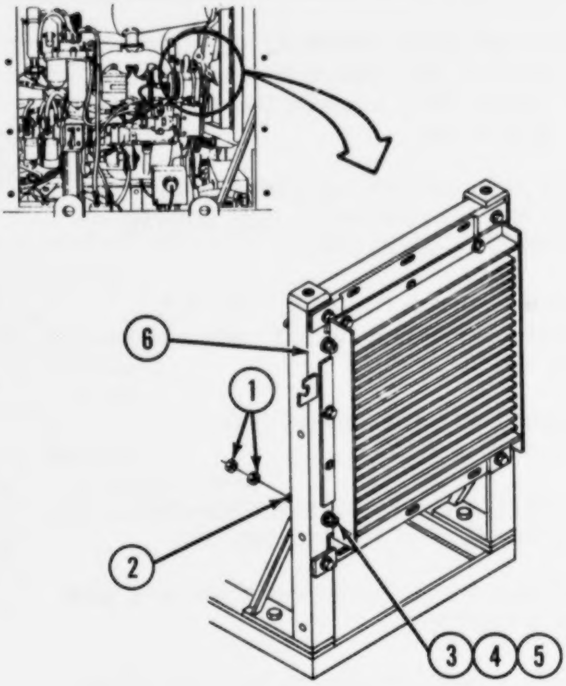
4. REMOVE FOUR SHOCK MOUNTS FROM LOUVER ASSEMBLY.
   - Install two nuts (1) on shock mount (5). Use 9/16 inch box end wrench.
   - Remove nut (6), lock washer (7), washer (8), and shock mount (5) from louver assembly (9). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle. Discard lock washer.
   - Remove two nuts (1) from shock mount (5). Use 9/16 inch box end wrench.
   - Repeat step 4 for other three shock mounts.



## D. RADIATOR INSTALLATION

1. INSTALL FOUR SHOCK MOUNTS ON LOUVER ASSEMBLY.
   - Install two nuts (1) on one end of shock mount (2). Use 9/16 inch box end wrench.
   - Install shock mount (2), washer (3), new lock washer (4), and nut (5) on louver assembly (6). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle.
   - Remove two nuts (1) from shock mount (2). Use 9/16 inch box end wrench.
   - Repeat step 1 for other three shock mounts.



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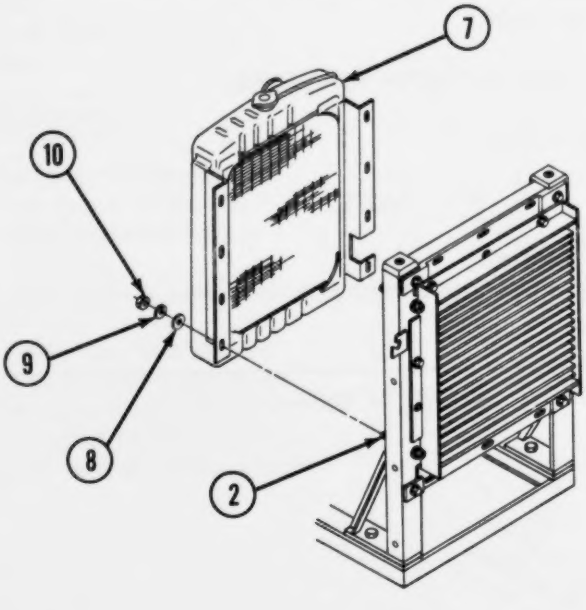
2. INSTALL RADIATOR ON FOUR SHOCK MOUNTS.
   - Install radiator (7), four washers (8), new lock washers (9), and nuts (10) on four shock mounts (2). Use 9/16 inch box end wrench and 9/16 inch socket with 5 inch extension and ratchet handle. Use helper.



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**D. RADIATOR INSTALLATION — Continued**

3. CONNECT INLET HOSE TO RADIATOR.
   - Connect inlet hose (1) to radiator (2), and tighten clamp screw (3). Use 1/4 inch flat tip screwdriver.

4. INSTALL CONTROL ASSEMBLY AND HOUSING ON RADIATOR. (SEE LOUVER ASSEMBLY, PAGE 15-431.)

5. INSTALL DRAIN COCK ON CONTROL ASSEMBLY AND HOUSING. (SEE TM 9-1095-205-20.)

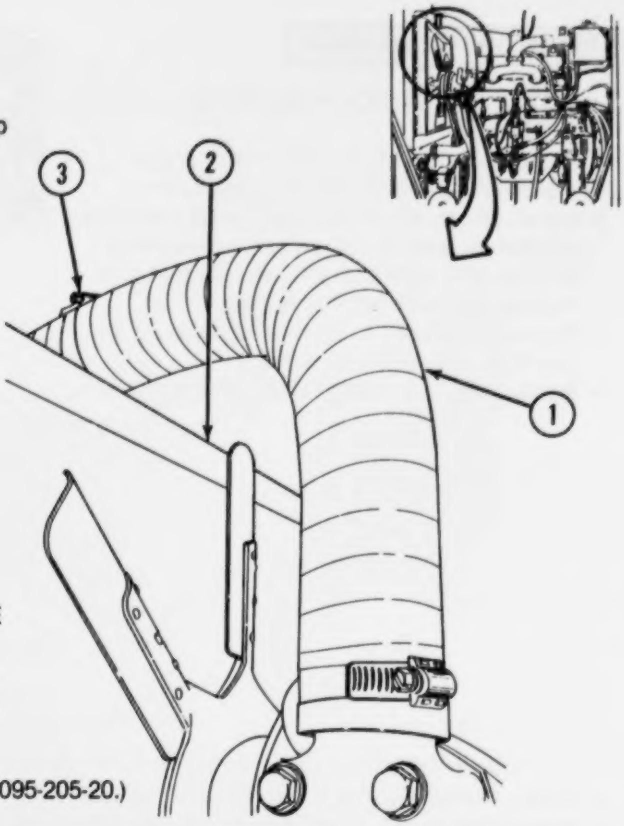
6. INSTALL FAN ON ENGINE. (SEE TM 9-1095-205-20.)

7. INSTALL ENGINE ASSEMBLY TOP ON SUPPORTS. (SEE TM 9-1095-205-20.)

8. INSTALL FRONT PANEL ON SUPPORTS. (SEE TM 9-1095-205-20.)

9. INSTALL FIXED PANEL ON SUPPORTS. (SEE TM 9-1095-205-20.)

10. INSTALL MUFFLER ON ENGINE. (SEE TM 9-1095-205-20.)



11. INSTALL ENGINE HINGED PANEL ON SUPPORTS. (SEE TM 9-1095-205-20.)

12. FILL RADIATOR. (SEE TM 9-1095-205-20.)

13. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

14. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)

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END OF TASK

## 15-31 METAL GRILLE

**DESCRIPTION**

This task covers:
A. REMOVAL (p 15-427)
B. INSTALLATION (p 15-428)

**INITIAL SETUP**

***Tools and Special Tools:***
General mechanic's tool kit
- 5180-00-177-7033:
  - Ratchet handle
  - 1/2 inch socket
  - 9/16 inch socket
  - 9/16 inch open end wrench

***Materials/Parts:***
Lock washer (6) 5310-00-407-9566

***Personnel Required:***
Mechanic
Helper

***References:***
TM 9-1095-205-10
TM 9-1095-205-20

**A. REMOVAL**

**NOTE**

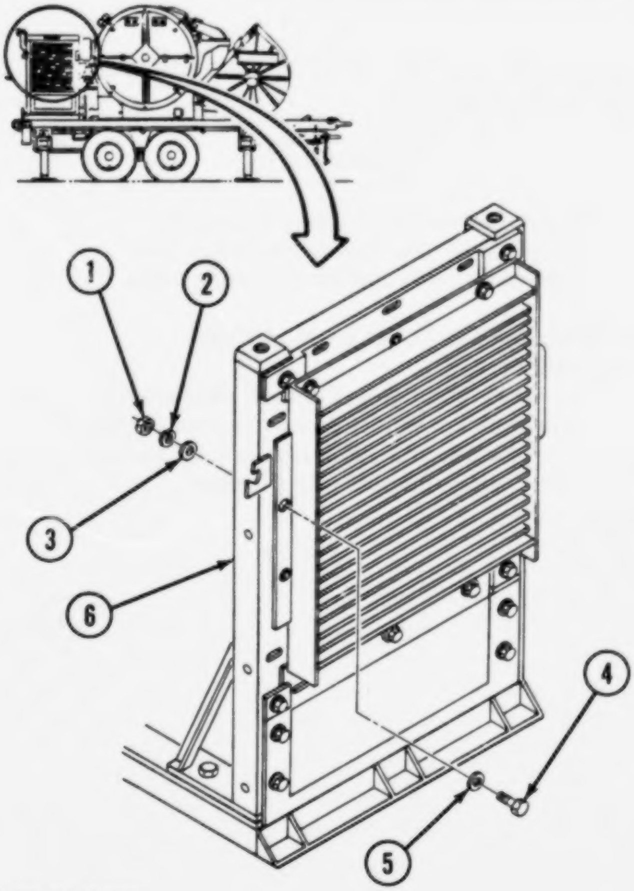
***PRELIMINARY PROCEDURES:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

REMOVE METAL GRILLE FROM LOUVER ASSEMBLY.

- Remove two nuts (1), lock washers (2), washers (3), screws (4), and washers (5) from two radiator supports (6). Use 9/16 inch open end wrench and 9/16 inch socket with ratchet handle. Discard lock washers.



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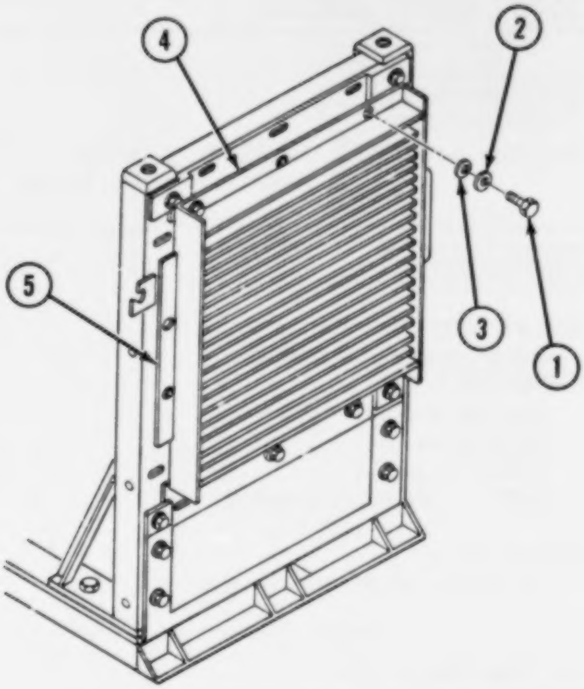
## A. REMOVAL — Continued

- Remove four screws (1), lock washers (2), washers (3) and metal grille (4) from louver assembly (5). Use 1/2 inch socket with ratchet handle. Use helper. Discard lock washers.



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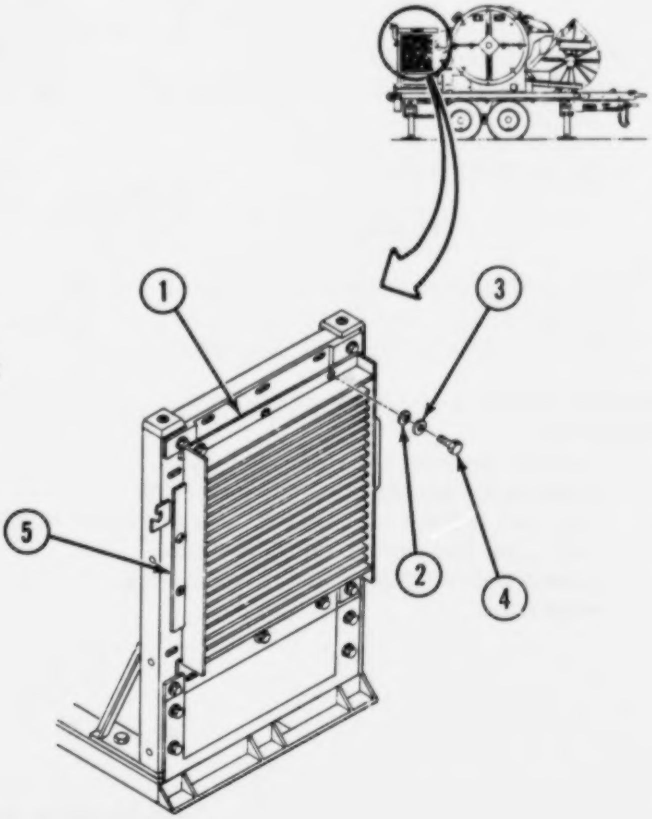
## B. INSTALLATION

**WARNING**

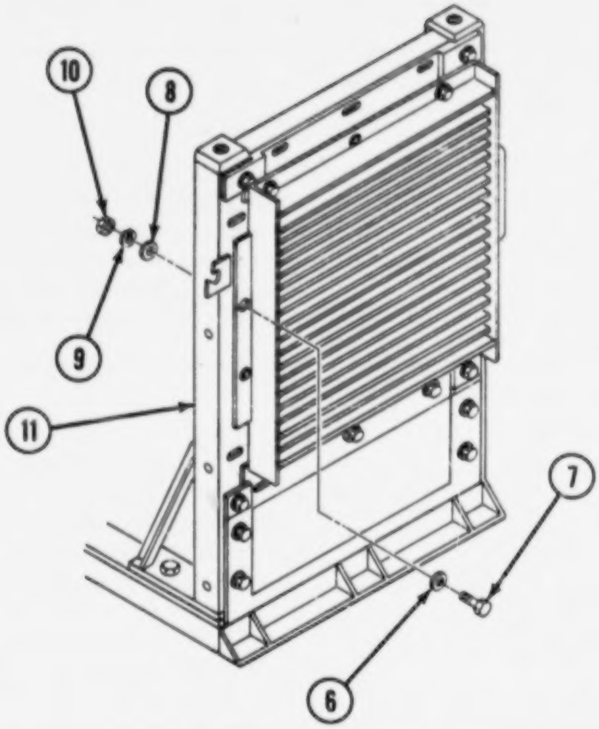
You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

INSTALL METAL GRILLE ON LOUVER ASSEMBLY.

- Install metal grille (1), four washers (2), new lock washers (3) and screws (4) on louver assembly (5). Use 1/2 inch socket with ratchet handle. Use helper.



- Install two washers (6), screws (7), washers (8), new lock washers (9), and nuts (10) on two radiator supports (11). Use 9/16 inch open end wrench and 9/16 inch socket with ratchet handle.



**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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END OF TASK

## 15-32 LOUVER ASSEMBLY

### DESCRIPTION

This task covers:
A. CONTROL ASSEMBLY AND HOUSING REMOVAL (p 15-431)
B. CONTROL ASSEMBLY AND HOUSING DISASSEMBLY (p 15-433)
C. CONTROL ASSEMBLY AND HOUSING REASSEMBLY (p 15-433)
D. CONTROL ASSEMBLY AND HOUSING INSTALLATION (p 15-434)
E. SHUTTER AND ROD ASSEMBLIES REMOVAL (p 15-435)
F. SHUTTER AND ROD ASSEMBLIES INSTALLATION (p 15-437)

### INITIAL SETUP

***Tools and Special Tools:***
- General mechanic's tool kit 5180-00-177-7033:
  - Ratchet handle
  - 3/8 inch socket
  - 1/2 inch socket
  - 9/16 inch socket
  - 3/8 inch box end wrench
  - 9/16 inch open end wrench (2)
  - Round nose pliers
  - 1/4 inch flat tip screwdriver
  - 5 inch extension
- Jam nut (2) 5310-00-891-1754

***Materials/Parts:***
- Lock washer (2) 5310-00-407-9566
- Gasket (2) 5330-00-251-4082
- Cotter pin (96309) 1155
- Adhesive sealant, Item 2, Appendix B

***References:***
- TM 9-1095-205-10
- TM 9-1095-205-20
- METAL GRILLE, Page 15-427
- RADIATOR AND DRAIN COCK FITTINGS, Page 15-421

### A. CONTROL ASSEMBLY AND HOUSING REMOVAL

**NOTE**

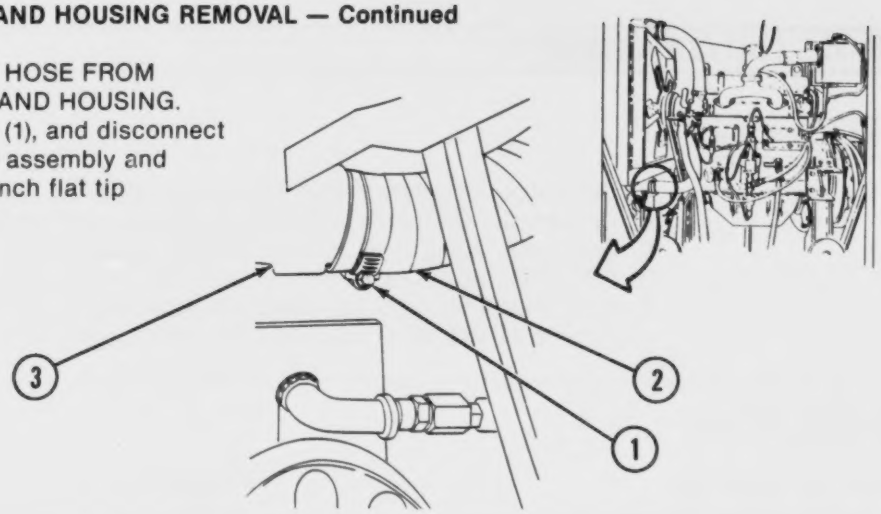
***PRELIMINARY PROCEDURES:***
Remove Fixed Panel. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Front Panel. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Drain Cock. (See TM 9-1095-205-20.)

1. REMOVE DRAIN COCK FITTINGS FROM RADIATOR. (SEE RADIATOR AND DRAIN COCK FITTINGS, PAGE 15-421.)

GO TO NEXT PAGE

## A. CONTROL ASSEMBLY AND HOUSING REMOVAL — Continued

2. DISCONNECT OUTLET HOSE FROM CONTROL ASSEMBLY AND HOUSING.
   - Loosen clamp screw (1), and disconnect hose (2) from control assembly and housing (3). Use 1/4 inch flat tip screwdriver.



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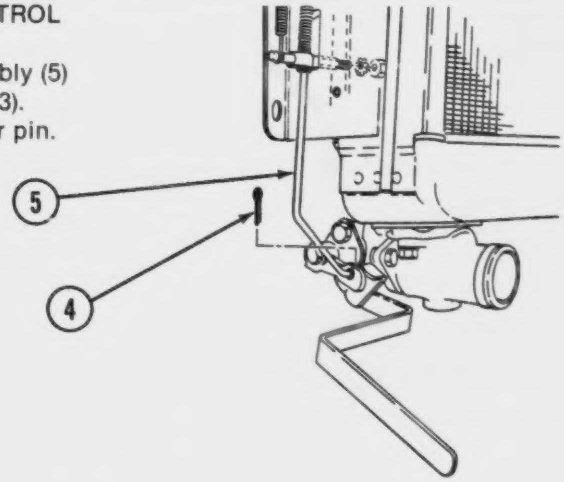
3. REMOVE ROD ASSEMBLY FROM CONTROL ASSEMBLY AND HOUSING.
   - Remove cotter pin (4) and rod assembly (5) from control assembly and housing (3). Use round nose pliers. Discard cotter pin.



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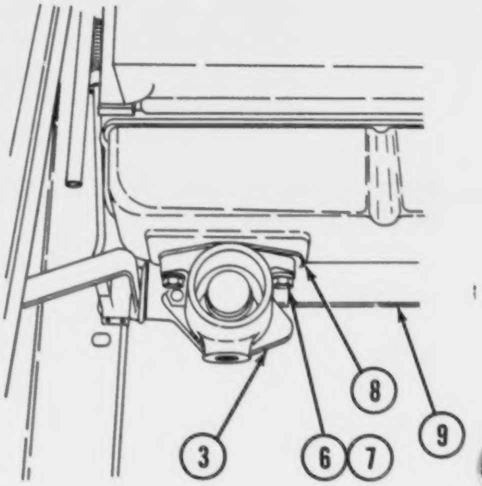
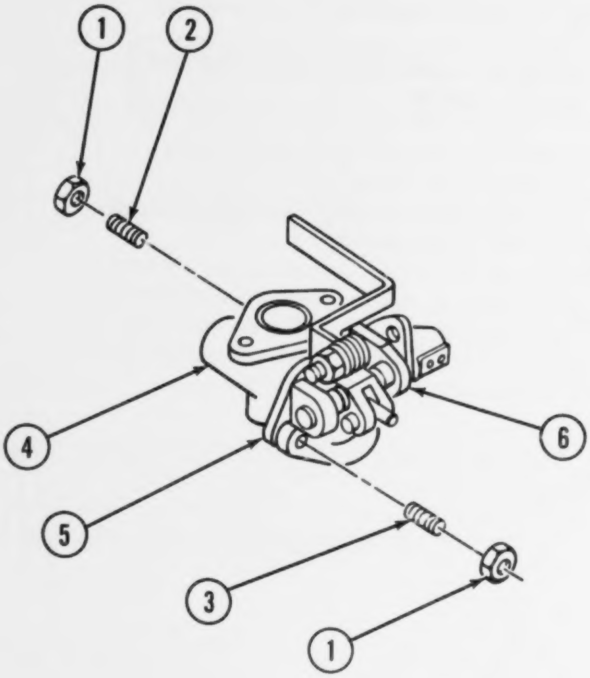
4. REMOVE CONTROL ASSEMBLY AND HOUSING FROM RADIATOR.
   - Remove two screws (6), washers (7), control assembly and housing (3), and gasket (8) from radiator (9). Use 9/16 inch open end wrench and 9/16 inch socket with 5 inch extension and ratchet handle. Discard gasket.



## B. CONTROL ASSEMBLY AND HOUSING DISASSEMBLY

DISASSEMBLE CONTROL ASSEMBLY AND HOUSING.

- Remove nuts (1) from threaded stud (2) and threaded stud (3). Use 9/16 inch open end wrench.
- Remove housing (4) and gasket (5) from control assembly (6). Discard gasket.
- Remove threaded stud (2) from housing (4). Use two jam nuts and two 9/16 inch open end wrenches.
- Remove threaded stud (3) from control assembly (6). Use two jam nuts and two 9/16 inch open end wrenches.



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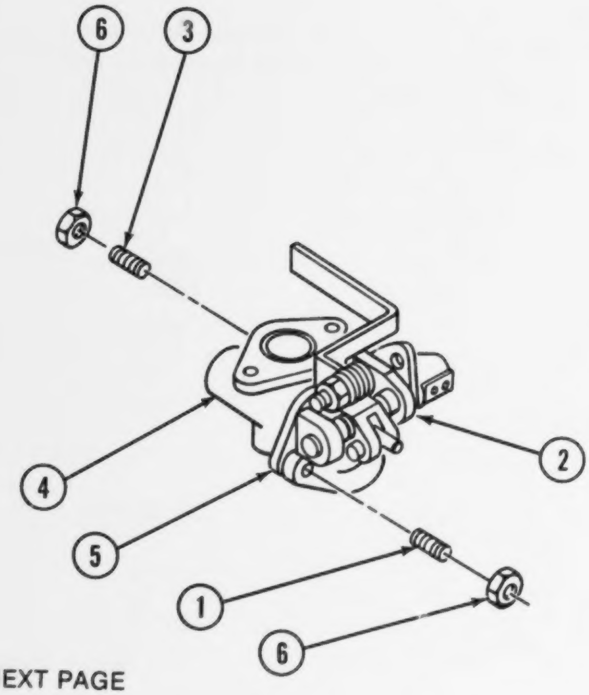
## C. CONTROL ASSEMBLY AND HOUSING REASSEMBLY

REASSEMBLE CONTROL ASSEMBLY AND HOUSING.

- Install threaded stud (1) in control assembly (2) until even with rear of control assembly. Use two jam nuts and two 9/16 inch open end wrenches.
- Install threaded stud (3) in housing (4) until even with rear of housing. Use two jam nuts and two 9/16 inch open end wrenches.
- Apply gasket sealing compound to both sides of new gasket (5).
- Position gasket (5) and housing (4) on control assembly (2).
- Install two nuts (6) on threaded stud (1) and threaded stud (3). Use 9/16 inch open end wrench.



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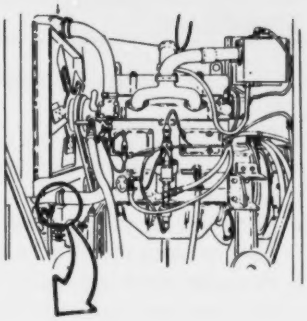
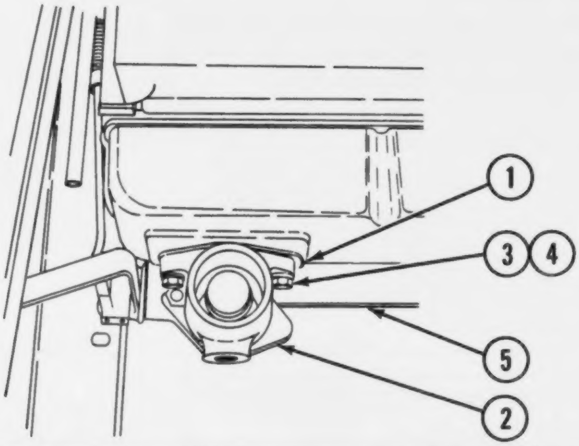
## 15-32 LOUVER ASSEMBLY — Continued

### D. CONTROL ASSEMBLY AND HOUSING INSTALLATION

1. INSTALL CONTROL ASSEMBLY AND HOUSING ON RADIATOR.
   - Apply gasket sealing compound to both sides of new gasket (1).
   - Install gasket (1), control assembly and housing (2), two washers (3), and screws (4) on radiator (5). Use 9/16 inch open end wrench and 9/16 inch socket with 5 inch extension and ratchet handle.





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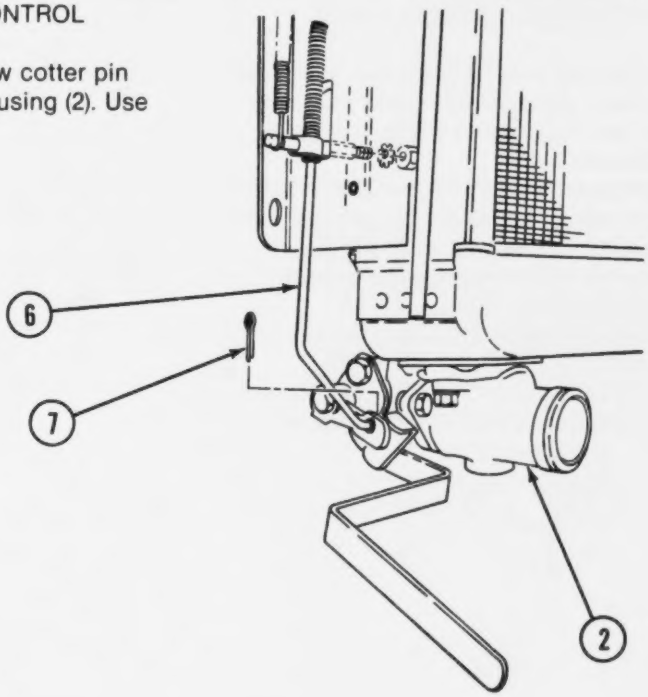
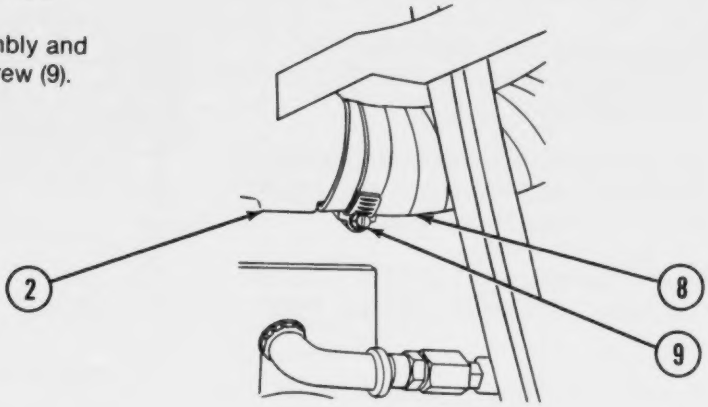
2. INSTALL ROD ASSEMBLY ON CONTROL ASSEMBLY AND HOUSING.
   - Install rod assembly (6) and new cotter pin (7) on control assembly and housing (2). Use round nose pliers.



3. CONNECT OUTLET HOSE TO CONTROL ASSEMBLY AND HOUSING.
   - Connect hose (8) to control assembly and housing (2), and tighten clamp screw (9). Use 1/4 inch flat tip screwdriver.



4. INSTALL DRAIN COCK FITTINGS ON RADIATOR. (SEE RADIATOR AND DRAIN COCK FITTINGS, PAGE 15-421.)

5. INSTALL DRAIN COCK ON CONTROL ASSEMBLY AND HOUSING. (SEE TM 9-1095-205-20.)

6. FILL RADIATOR. (SEE TM 9-1095-205-20.)

7. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

8. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

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## E. SHUTTER AND ROD ASSEMBLIES REMOVAL

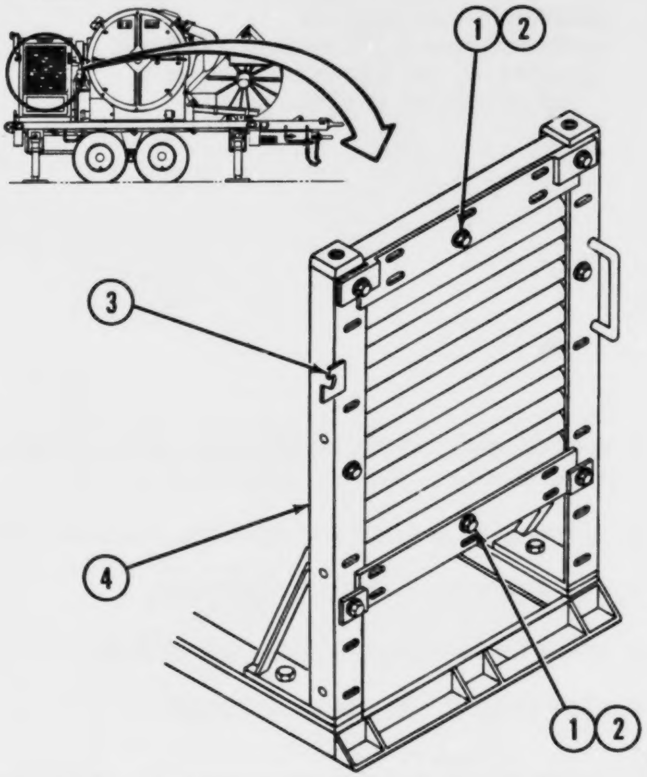
**NOTE**

***PRELIMINARY PROCEDURES:***
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Drain Cock. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Fan. (See TM 9-1095-205-20.)

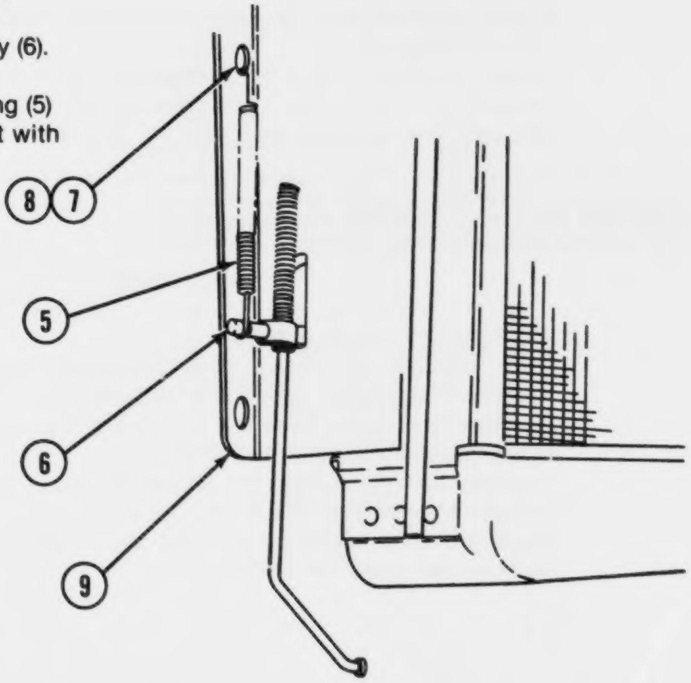
GO TO NEXT PAGE

## E. SHUTTER AND ROD ASSEMBLIES REMOVAL — Continued

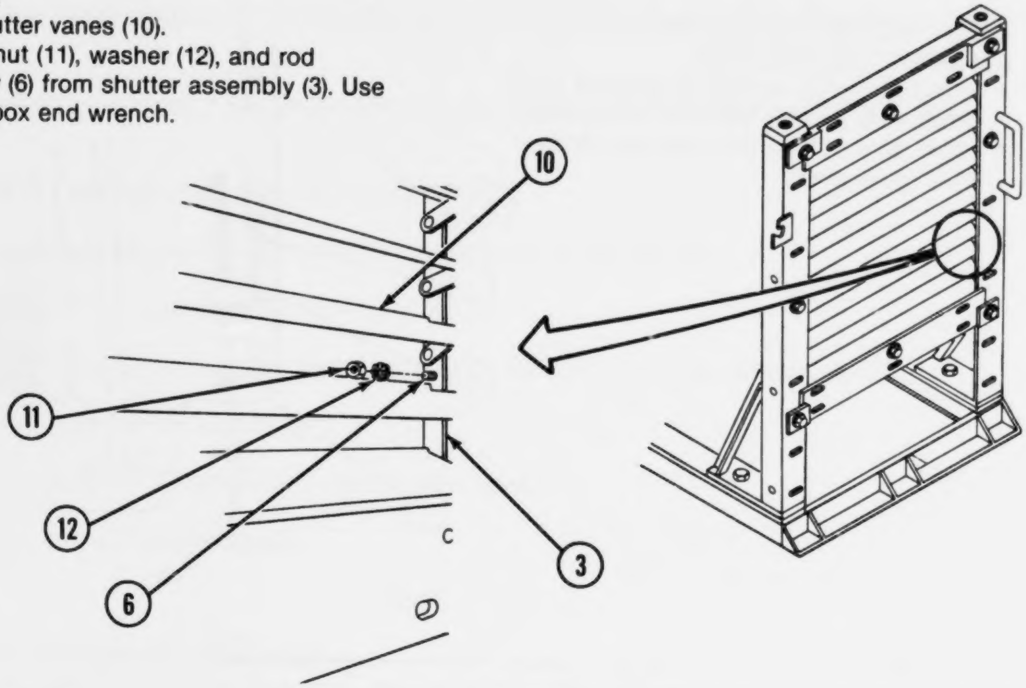
1. REMOVE CONTROL ASSEMBLY AND HOUSING FROM DISPENSER. (SEE LOUVER ASSEMBLY, PAGE 15-431.)
2. REMOVE RADIATOR FROM RADIATOR SUPPORTS. (SEE RADIATOR AND DRAIN COCK FITTINGS, PAGE 15-421.)
3. REMOVE METAL GRILLE FROM LOUVER ASSEMBLY. (SEE METAL GRILLE, PAGE 15-427.)
4. REMOVE SHUTTER ASSEMBLY FROM TWO RADIATOR SUPPORTS.
   - Remove screws (1), lock washers (2), and shutter assembly (3) from two supports (4). Use 1/2 inch socket with ratchet handle. Discard lock washers.



5. REMOVE RETURN SPRING FROM ROD ASSEMBLY AND RADIATOR.
   - Remove spring (5) from rod assembly (6). Use round nose pliers.
   - Remove nut (7), washer (8), and spring (5) from radiator (9). Use 3/8 inch socket with ratchet handle.

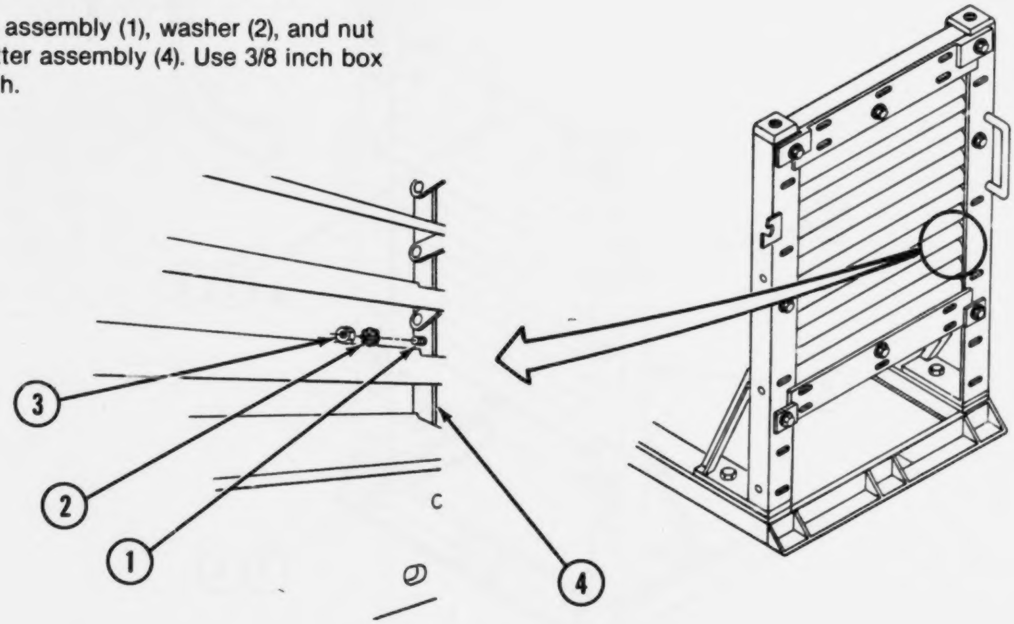


6. REMOVE ROD ASSEMBLY FROM SHUTTER ASSEMBLY.
   - Open shutter vanes (10).
   - Remove nut (11), washer (12), and rod assembly (6) from shutter assembly (3). Use 3/8 inch box end wrench.



## F. SHUTTER AND ROD ASSEMBLIES INSTALLATION

1. INSTALL ROD ASSEMBLY ON SHUTTER ASSEMBLY.
   - Install rod assembly (1), washer (2), and nut (3) on shutter assembly (4). Use 3/8 inch box end wrench.



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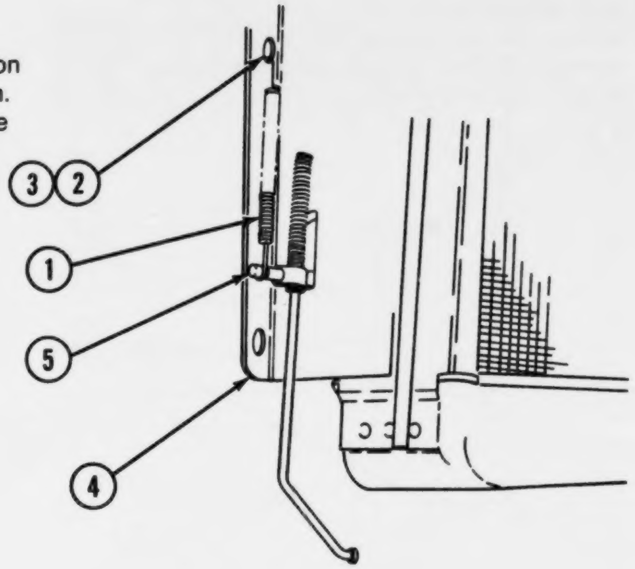
## F. SHUTTER AND ROD ASSEMBLIES INSTALLATION — Continued

2. INSTALL RETURN SPRING ON ROD ASSEMBLY AND RADIATOR.
   - Install spring (1), washer (2), and nut (3) on radiator (4). Use 3/8 inch box end wrench.
   - Install spring (1) on rod assembly (5). Use round nose pliers.



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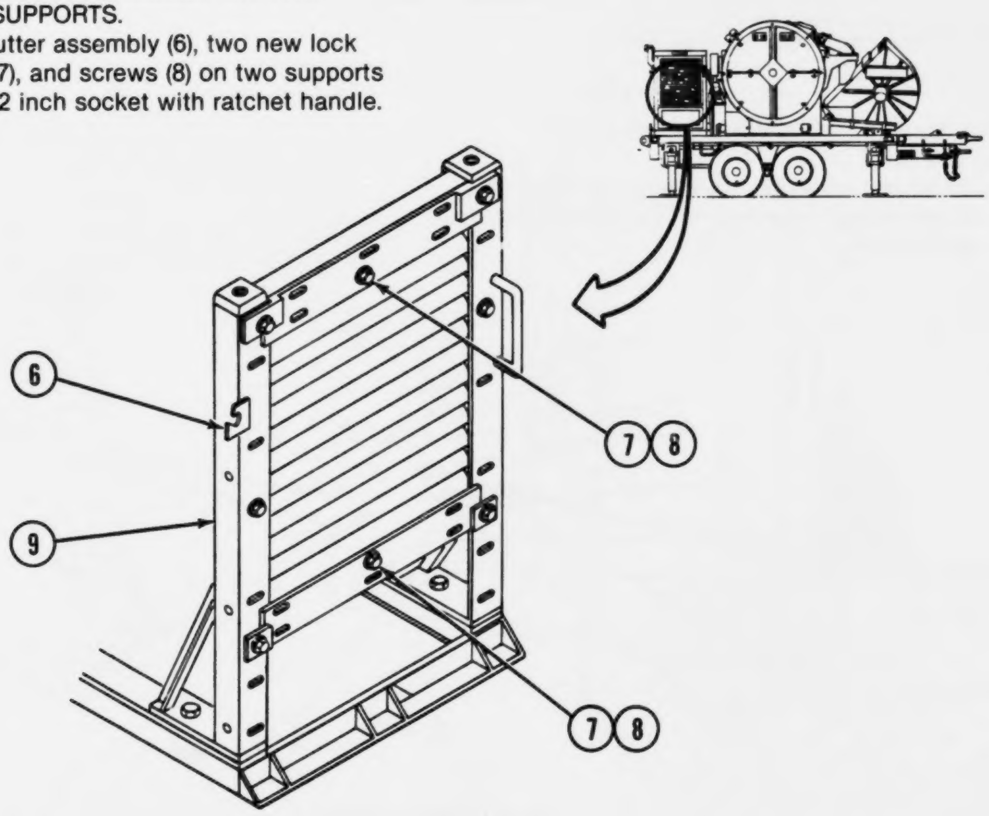
3. INSTALL SHUTTER ASSEMBLY ON TWO RADIATOR SUPPORTS.
   - Install shutter assembly (6), two new lock washers (7), and screws (8) on two supports (9). Use 1/2 inch socket with ratchet handle.



4. INSTALL METAL GRILLE ON LOUVER ASSEMBLY. (SEE METAL GRILLE, PAGE 15-427.)
5. INSTALL RADIATOR ON RADIATOR SUPPORTS. (SEE RADIATOR AND DRAIN COCK FITTINGS, PAGE 15-421.)
6. INSTALL CONTROL ASSEMBLY AND HOUSING ON DISPENSER. (SEE LOUVER ASSEMBLY, PAGE 15-434.)
7. INSTALL FAN ON ENGINE. (SEE TM 9-1095-205-20.)
8. INSTALL ENGINE ASSEMBLY TOP ON SUPPORTS. (SEE TM 9-1095-205-20.)
9. INSTALL MUFFLER ON ENGINE. (SEE TM 9-1095-205-20.)
10. INSTALL DRAIN COCK ON CONTROL ASSEMBLY AND HOUSING. (SEE TM 9-1095-205-20.)
11. FILL RADIATOR. (SEE TM 9-1095-205-20.)
12. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.
13. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-33 RADIATOR SUPPORT ASSEMBLY

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-441)
B. DISASSEMBLY (p 15-443)
C. REASSEMBLY (p 15-443)
D. INSTALLATION (p 15-444)

### INITIAL SETUP

*Tools and Special Tools:*
General mechanic's tool kit
5180-00-177-7033:
Ratchet handle
3/4 inch socket
9/16 inch box end wrench
9/16 inch socket
1/2 inch socket

*Materials/Parts:*
Lock washer (2) 5310-00-407-9566
Self-locking nut (4) 5310-00-087-4652

*Personnel Required:*
Mechanic
Helper

*References:*
TM 9-1095-205-10
TM 9-1095-205-20
METAL GRILLE, Page 15-427
RADIATOR AND DRAIN COCK FITTINGS, Page 15-421

### A. REMOVAL

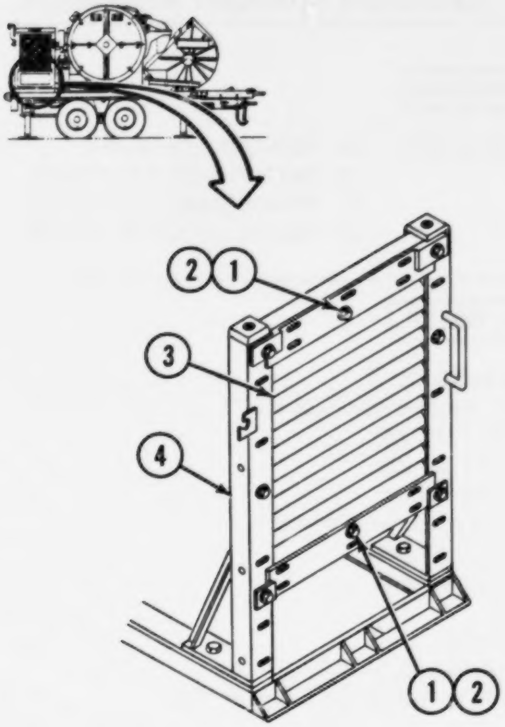
**NOTE**

***PRELIMINARY PROCEDURES:***
Remove Hinged Panel. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Remove Drain Cock. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Fan. (See TM 9-1095-205-20.)
Remove Radiator. (See Radiator and Drain Cock Fittings, Page 15-421.)
Remove Metal Grille. (See Metal Grille, Page 15-427.)

GO TO NEXT PAGE

## A. REMOVAL — Continued

1. REMOVE SHUTTER ASSEMBLY FROM RADIATOR SUPPORT ASSEMBLY.
   - Remove screws (1), lock washers (2), and shutter assembly (3) from support assembly (4). Use 1/2 inch socket with ratchet handle. Discard lock washers.



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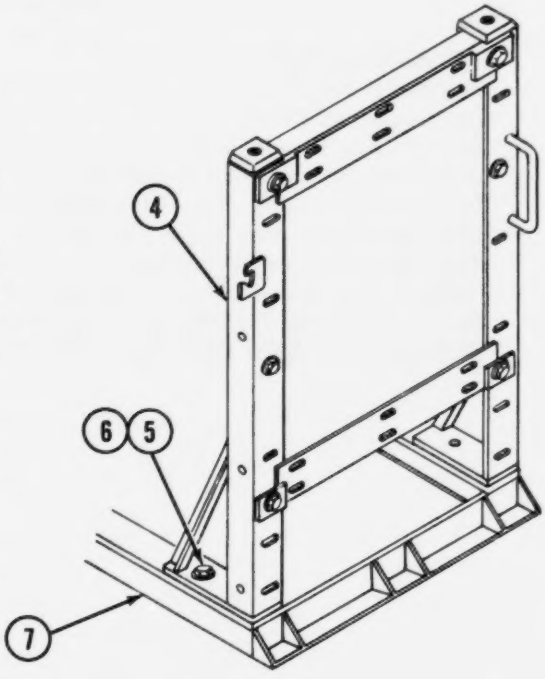
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

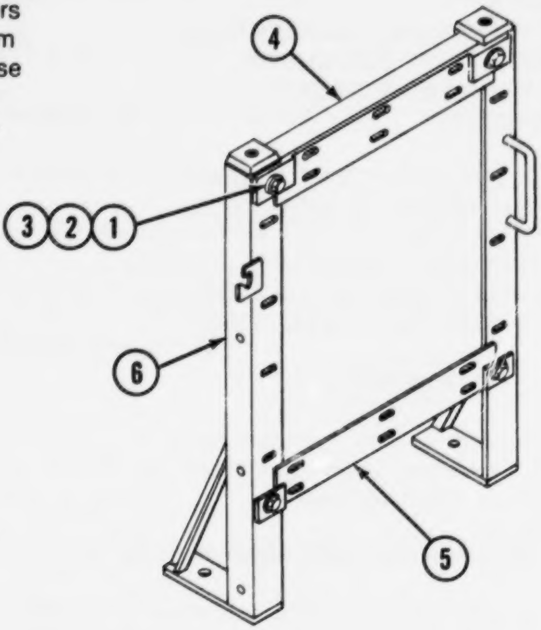
2. REMOVE RADIATOR SUPPORT ASSEMBLY FROM PALLET.
   - Remove two screws (5), washers (6), and support assembly (4) from pallet (7). Use 3/4 inch socket with ratchet handle. Use helper.



## B. DISASSEMBLY

DISASSEMBLE RADIATOR SUPPORT ASSEMBLY.

- Remove four self-locking nuts (1), washers (2), screws (3), top support (4), and bottom support (5) from two side supports (6). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle. Discard self-locking nuts.



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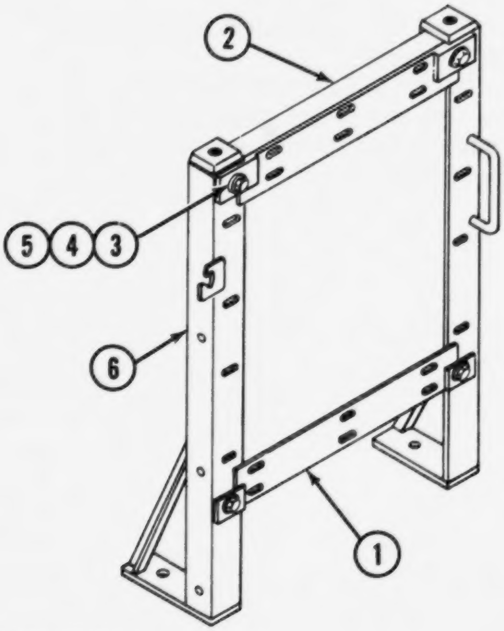
## C. REASSEMBLY

REASSEMBLE RADIATOR SUPPORT ASSEMBLY.

- Install bottom support (1), top support (2), four screws (3), washers (4), and new self-locking nuts (5) on two side supports (6). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle.



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## 15-33 RADIATOR SUPPORT ASSEMBLY — Continued

### D. INSTALLATION

1. REMOVE TWO SPLINED SELF-LOCKING NUTS FROM PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

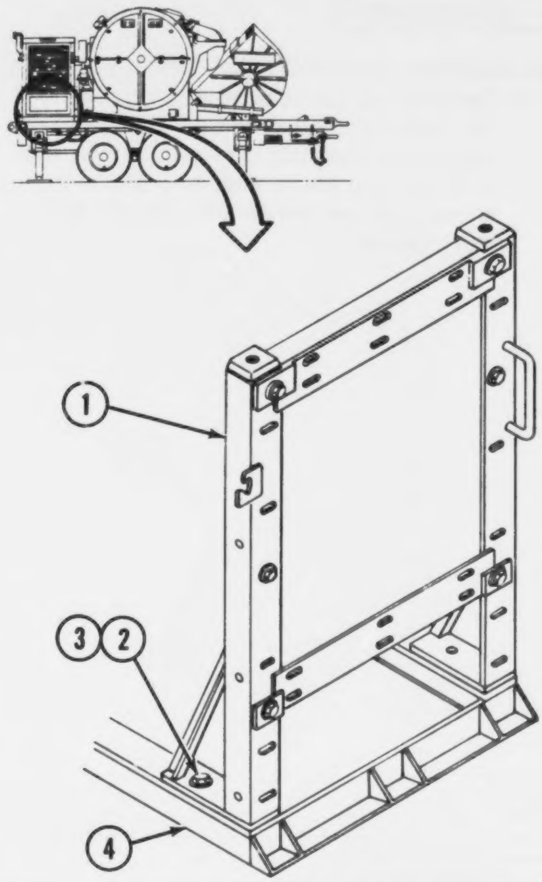
2. REPAIR PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

3. INSTALL TWO NEW SPLINED SELF-LOCKING NUTS ON PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

4. INSTALL RADIATOR SUPPORT ASSEMBLY ON PALLET.
   - Install support assembly (1), two washers (2), and screws (3) on pallet (4). Use 3/4 inch socket with ratchet handle. Use helper.



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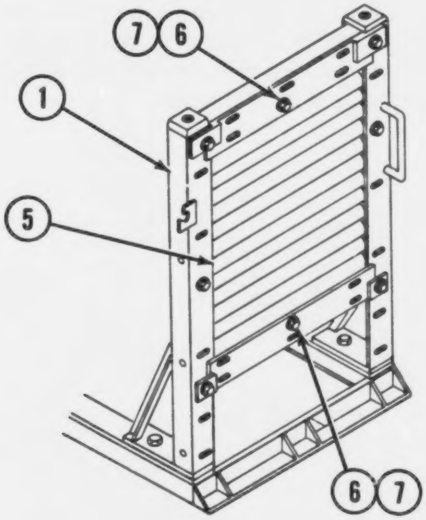
5. INSTALL SHUTTER ASSEMBLY ON RADIATOR SUPPORT ASSEMBLY.
   - Install shutter assembly (5), new lock washers (6), and screws (7) on support assembly (1). Use 1/2 inch socket with ratchet handle.



6. INSTALL METAL GRILLE ON RADIATOR. (SEE METAL GRILLE, PAGE 15-427.)
7. INSTALL RADIATOR ON ENGINE. (SEE RADIATOR AND DRAIN COCK FITTINGS, PAGE 15-421.)
8. INSTALL FAN ON ENGINE. (SEE TM 9-1095-205-20.)
9. INSTALL ENGINE ASSEMBLY TOP ON SUPPORTS. (SEE TM 9-1095-205-20.)
10. INSTALL MUFFLER ON ENGINE. (SEE TM 9-1095-205-20.)
11. INSTALL DRAIN COCK ON CONTROL ASSEMBLY AND HOUSING. (SEE TM 9-1095-205-20.)
12. FILL RADIATOR. (SEE TM 9-1095-205-20.)
13. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.
14. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Disconnect And Stow Operator Control Box And Cable. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Install Hinged Panel. (See TM 9-1095-205-20.)

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END OF TASK

## 15-34 ENGINE ASSEMBLY PALLET

**DESCRIPTION**

This task covers:
A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL (p 15-448)
B. ENGINE ASSEMBLY PALLET REMOVAL (p 15-466)
C. ENGINE ASSEMBLY PALLET INSTALLATION (p 15-467)
D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION (p 15-467)

---

**INITIAL SETUP**

***Tools and Special Tools:***

- General mechanic's tool kit 5180-00-177-7033:
  - 3/4 inch socket
  - 7/8 inch open end wrench
  - 1 inch open end wrench
  - 11/16 inch open end wrench
  - 5/16 inch flat tip screwdriver
  - 1/4 inch flat tip screwdriver
  - 3/4 inch open end wrench
  - 7/16 inch box end wrench
  - 7/16 inch socket
  - 1 1/8 inch socket
  - 5 inch extension
  - 10 inch extension
  - 1/2 inch open end wrench
  - Universal joint
  - 9/16 inch open end wrench
  - 7/16 inch open end wrench
  - 3/4 inch box end wrench
  - 5/8 inch box end wrench
  - 15/16 inch open end wrench (2)
  - 15/16 inch box end wrench
  - Aligning punch
  - 15/16 inch socket
  - Ratchet handle
  - 9/16 inch box end wrench
  - 9/16 inch socket
  - Pocket knife
  - 3/4 inch drive pin punch
  - Ball peen hammer
- 1 1/4 inch open end wrench 5120-00-277-2694
- 1 1/2 inch open end wrench 5120-00-184-8439

***Tools and Special Tools: — Continued***

- 1 1/16 inch open end wrench 5120-00-277-2693
- 1 1/8 inch box end wrench 5120-00-277-2694
- Engine and transmission sling 4910-00-944-4915
- Hoist 3950-00-965-0097
- Cap and plug set 5340-00-450-5718
- Measuring tape 5210-00-245-0301

***Materials/Parts:***

- Self-locking nut (5) 5310-00-088-1251
- Self-locking nut (4) 5310-00-269-4040
- Self-locking nut (2) 5310-00-087-4652
- Self-locking nut (6) 5310-00-067-6356
- Self-locking screw 5306-01-031-1434
- Lock washer (2) 5310-00-194-1483
- Lock washer 5310-00-209-0965
- Lock washer 5310-00-637-9541
- Rags, Item 22, Appendix B
- Resilient mount (2) 5340-00-409-5788

***Personnel Required:***

- Mechanic
- Helper

***References:***

- TM 9-1095-205-10
- TM 9-1095-205-20
- ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET, Page 15-91

GO TO NEXT PAGE

## 15-34 ENGINE ASSEMBLY PALLET—Continued

### OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Fuel, hydraulic, oil, and coolant hose assemblies and tube assemblies have fluid in them. Loosen hose and tube assembly couplings slowly. Catch fluid with rags or in suitable containers. Wipe up spilled fluid. Dispose of drained fluid according to local procedures.

If you remove or disconnect more than one hose assembly or tube assembly, tag and mark each one. Remove tags after installing or connecting hose assemblies or tube assemblies.

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### A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL

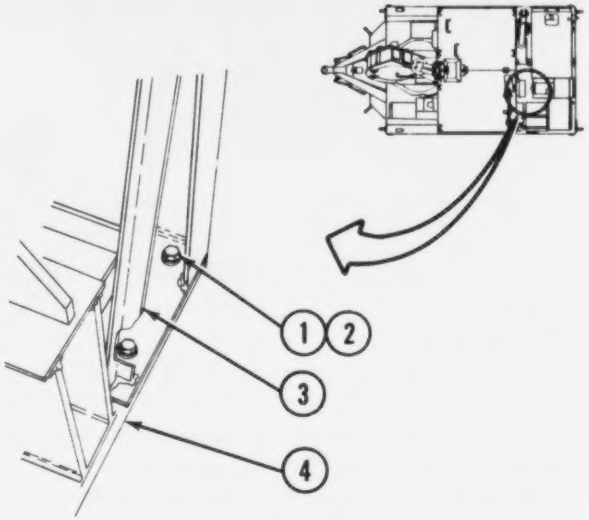
**NOTE**

***PRELIMINARY PROCEDURES:***

Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Hinged Panel. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Fixed Panel Support. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-10.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Mounting Bracket. (See TM 9-1095-205-20.)
Remove Return To Tank Pallet Tube Assembly. (See Engine Fuel Hoses, Fittings, and Fuel Filter Bracket, Page 15-91.)
Remove Suction To Fuel Pump Pallet Tube Assembly. (See Engine Fuel Hoses, Fittings, and Fuel Filter Bracket, Page 15-91.)
Remove Coolant Heater Fuel Inlet Hose. (See TM 9-1095-205-20.)
Remove Left Engine Pallet Bulkhead Elbow. (See Engine Fuel Hoses, Fittings, and Fuel Filter Bracket, Page 15-91.)
Remove Left Engine Pallet Bulkhead Tee. (See Engine Fuel Hoses, Fittings, and Fuel Filter Bracket, Page 15-91.)
Remove Coolant Heater Cable Assembly. (See TM 9-1095-205-20.)
Close Coolant Heater Shutoff Valves. (See TM 9-1095-205-10.)

Remove Coolant Heater To Engine Hose. (See TM 9-1095-205-20.)
Remove Engine Governor And Fuel Shutoff Control Assembly Lever Shield. (See TM 9-1095-205-20.)

1. REMOVE LEFT HAND PALLET TOP SUPPORT FROM ENGINE ASSEMBLY PALLET.
   - Remove two screws (1), washers (2), and support (3) from pallet (4). Use 3/4 inch socket with ratchet handle.



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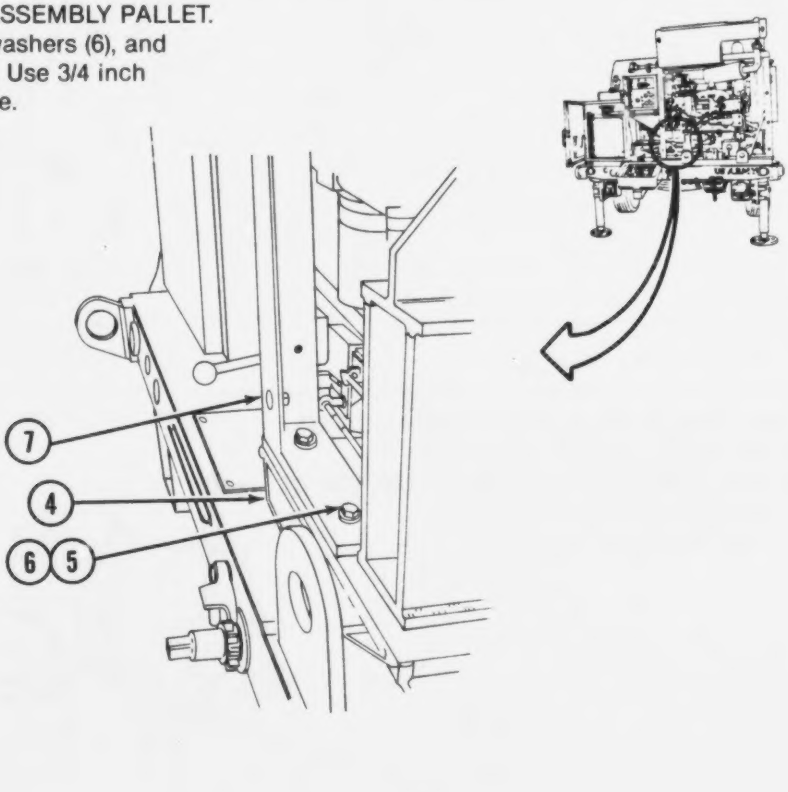
2. REMOVE RIGHT HAND PALLET TOP SUPPORT FROM ENGINE ASSEMBLY PALLET.
   - Remove two screws (5), washers (6), and support (7) from pallet (4). Use 3/4 inch socket with ratchet handle.



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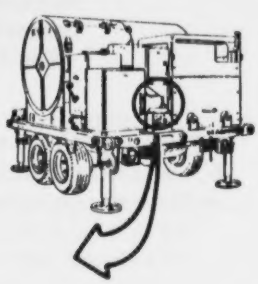
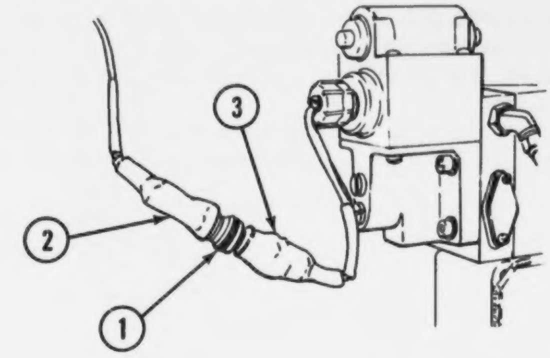
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

3. TURN CONNECTOR SLEEVE (1), AND DISCONNECT CONNECTOR P32 (2) FROM LEFT SERVO ACTUATOR RECEPTACLE J32 (3).





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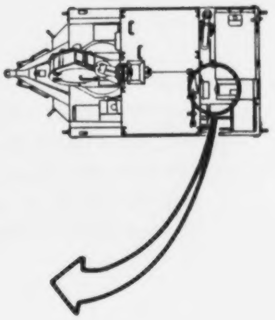
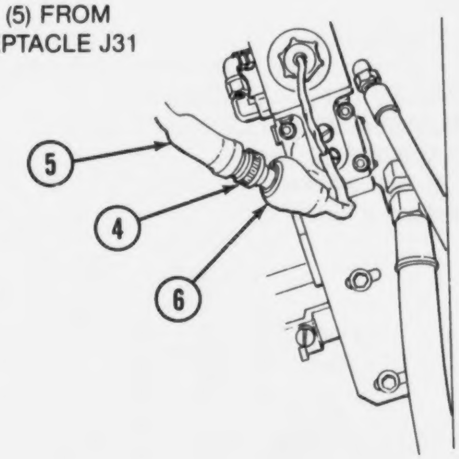
4. TURN CONNECTOR SLEEVE (4), AND DISCONNECT CONNECTOR P31 (5) FROM RIGHT SERVO ACTUATOR RECEPTACLE J31 (6).





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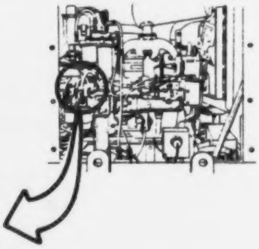
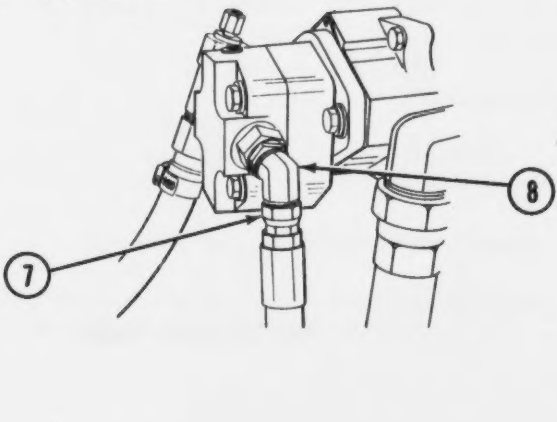
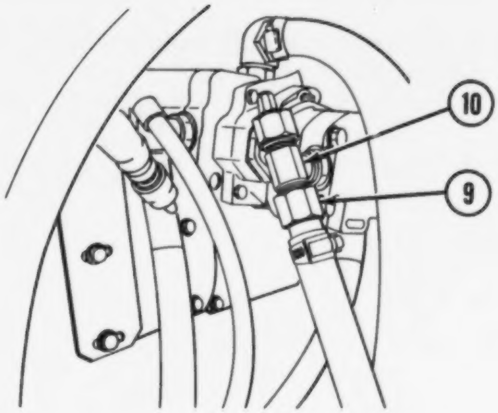
5. DISCONNECT OSCILLATOR PUMP OUTPUT HOSE FROM OUTPUT ELBOW.
   - Disconnect hose (7) from elbow (8). Use 7/8 inch open end wrench.
   - Plug hose, and cap elbow.





6. DISCONNECT OSCILLATOR PUMP SUCTION HOSE FROM TEE.
   - Disconnect hose (9) from tee (10). Use 1 1/4 inch open end wrench.
   - Plug hose, and cap tee.



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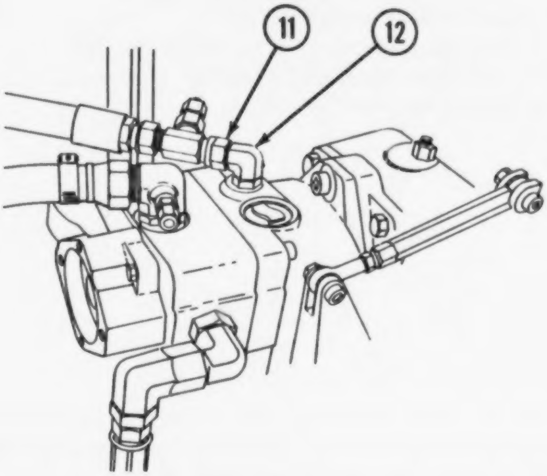
7. DISCONNECT DRAIN HOSE TEE FROM ELBOW.
   - Disconnect tee (11) from elbow (12). Use 1 inch open end wrench.
   - Plug tee, and cap elbow.



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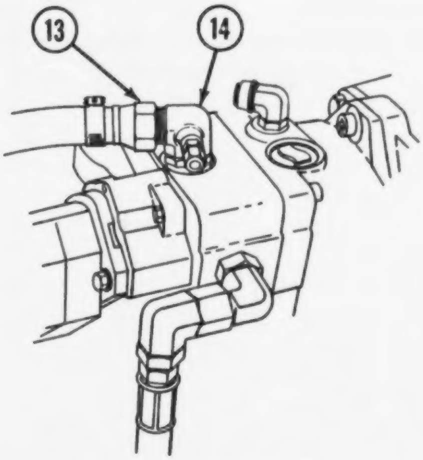
8. DISCONNECT SUCTION HOSE FROM LAUNCHER PUMP ELBOW.
   - Disconnect hose (13) from elbow (14). Use 1 1/2 inch open end wrench.
   - Plug hose, and cap elbow.



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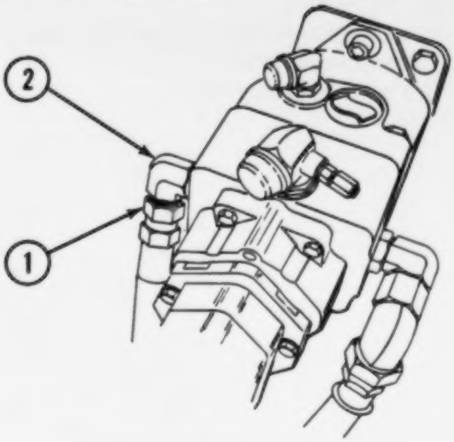
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

9. DISCONNECT OUTLET HOSE FROM LAUNCHER PUMP ELBOW.
   - Disconnect hose (1) from elbow (2). Use 1 1/2 inch open end wrench.
   - Plug hose, and cap elbow.



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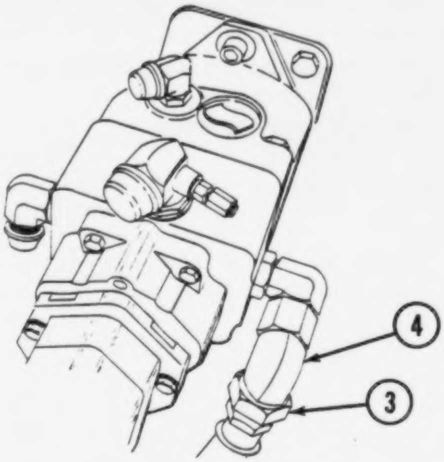
10. DISCONNECT RETURN HOSE FROM LAUNCHER PUMP ELBOW.
    - Disconnect hose (3) from elbow (4). Use 1 1/2 inch open end wrench.
    - Plug hose, and cap elbow.



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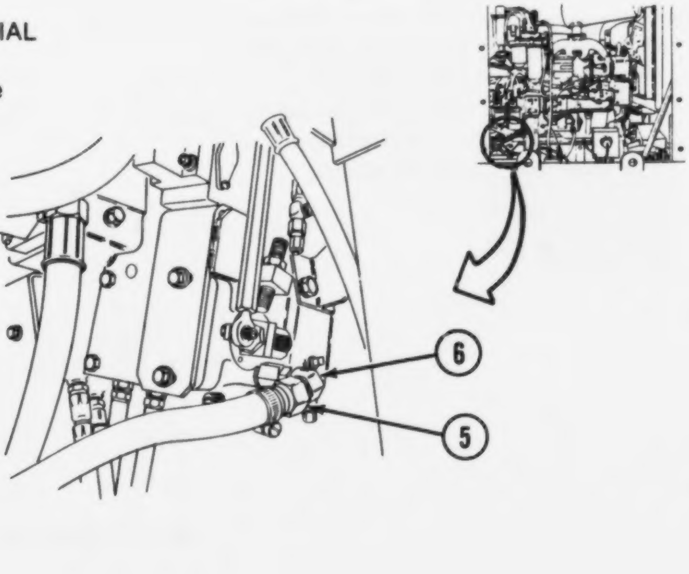
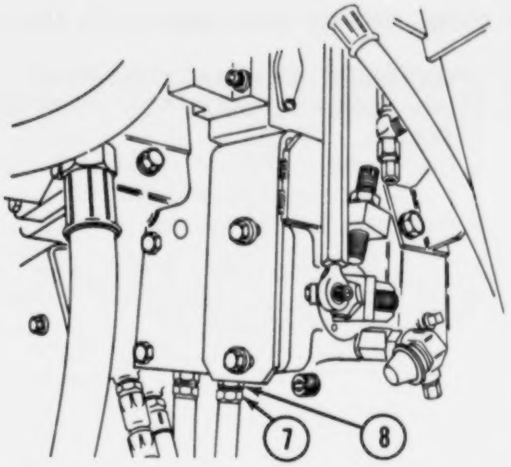
11. DISCONNECT LEFT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW.
    - Disconnect hose (5) from elbow (6). Use 1 1/4 inch open end wrench.
    - Plug hose, and cap elbow.



12. DISCONNECT LEFT MAGAZINE FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
    - Disconnect hose (7) from adapter (8). Use 7/8 inch open end wrench.
    - Plug hose, and cap adapter.



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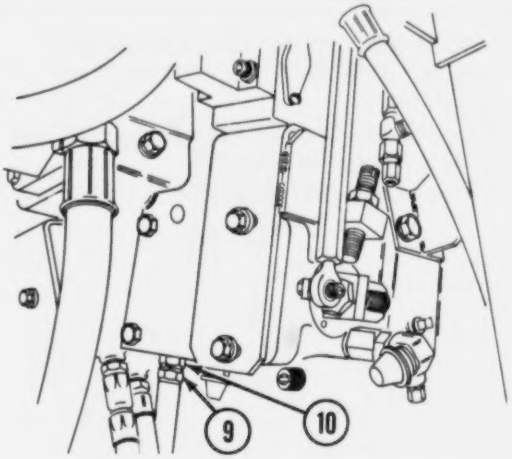
13. DISCONNECT LEFT MAGAZINE FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
    - Disconnect hose (9) from adapter (10). Use 7/8 inch open end wrench.
    - Plug hose, and cap adapter.



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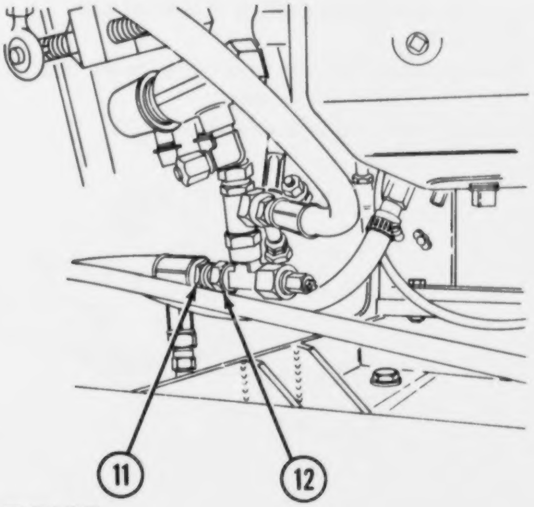
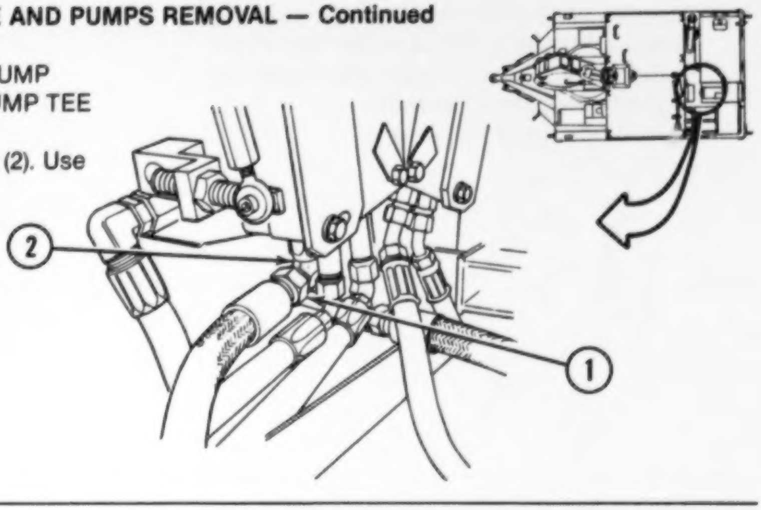
14. DISCONNECT LEFT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM PUMP TEE REDUCER.
    - Disconnect hose (11) from reducer (12). Use 1 1/16 inch open end wrench.
    - Plug hose, and cap reducer.



GO TO NEXT PAGE

## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

15. DISCONNECT RIGHT MAGAZINE PUMP DRAIN HOSE ASSEMBLY FROM PUMP TEE REDUCER.
    - Disconnect hose (1) from reducer (2). Use 1 1/16 inch open end wrench.
    - Plug hose, and cap reducer.



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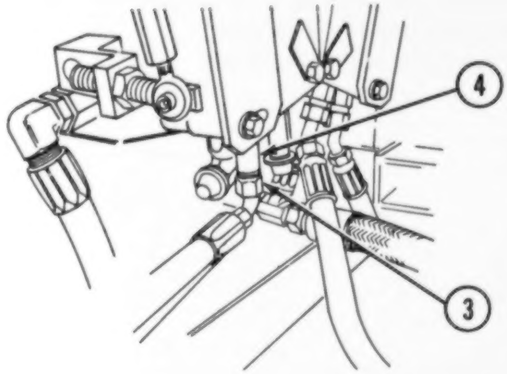
16. DISCONNECT RIGHT MAGAZINE FEED LINE A HOSE ASSEMBLY FROM PUMP ADAPTER.
    - Disconnect hose (3) from adapter (4). Use 7/8 inch open end wrench.
    - Plug hose, and cap adapter.



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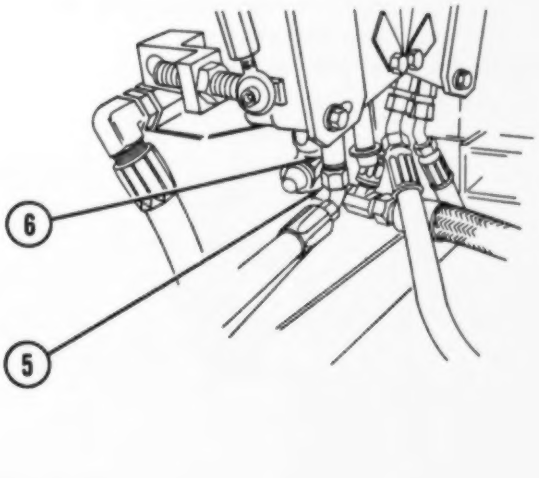
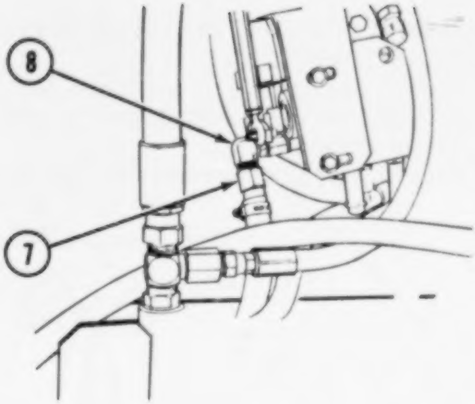
17. DISCONNECT RIGHT MAGAZINE FEED LINE B HOSE ASSEMBLY FROM PUMP ADAPTER.
    - Disconnect hose (5) from adapter (6). Use 7/8 inch open end wrench.
    - Plug hose, and cap adapter.



18. DISCONNECT RIGHT MAGAZINE PUMP SUCTION HOSE ASSEMBLY FROM SPECIAL PUMP ELBOW.
    - Disconnect hose (7) from elbow (8). Use 1 1/4 inch open end wrench.
    - Plug hose, and cap elbow.



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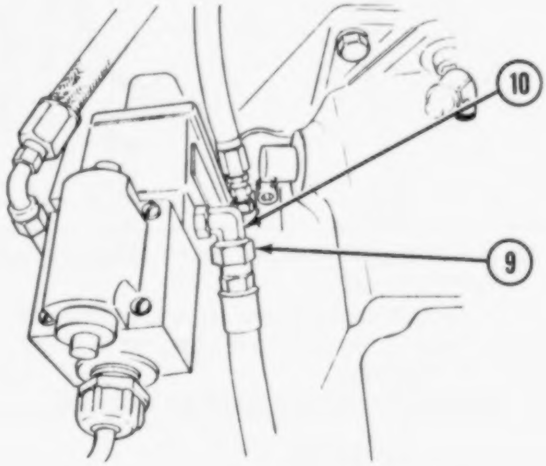
19. DISCONNECT RIGHT SERVO ACTUATOR DRAIN HOSE ASSEMBLY FROM SERVO ELBOW.
    - Disconnect hose (9) from elbow (10). Use 3/4 inch open end wrench.
    - Plug hose, and cap elbow.



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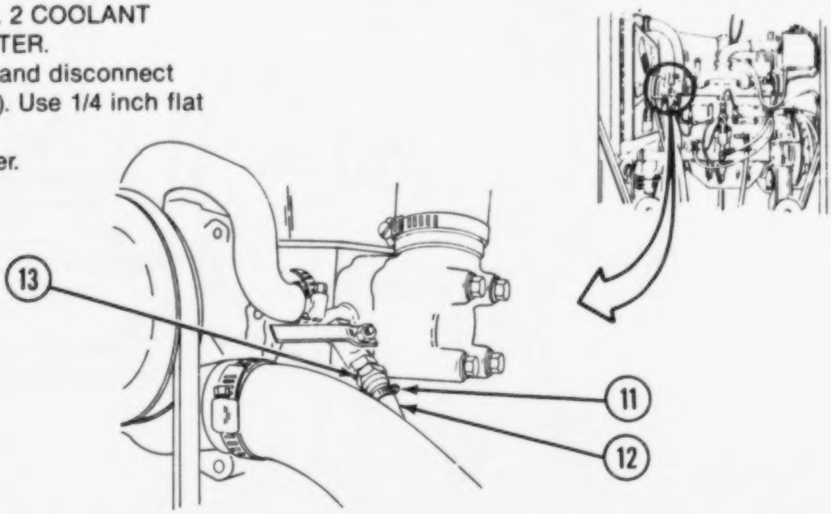
20. DISCONNECT BATTERY NO. 2 COOLANT SUPPLY HOSE FROM ADAPTER.
    - Loosen clamp screw (11), and disconnect hose (12) from adapter (13). Use 1/4 inch flat tip screwdriver.
    - Plug hose, and cap adapter.



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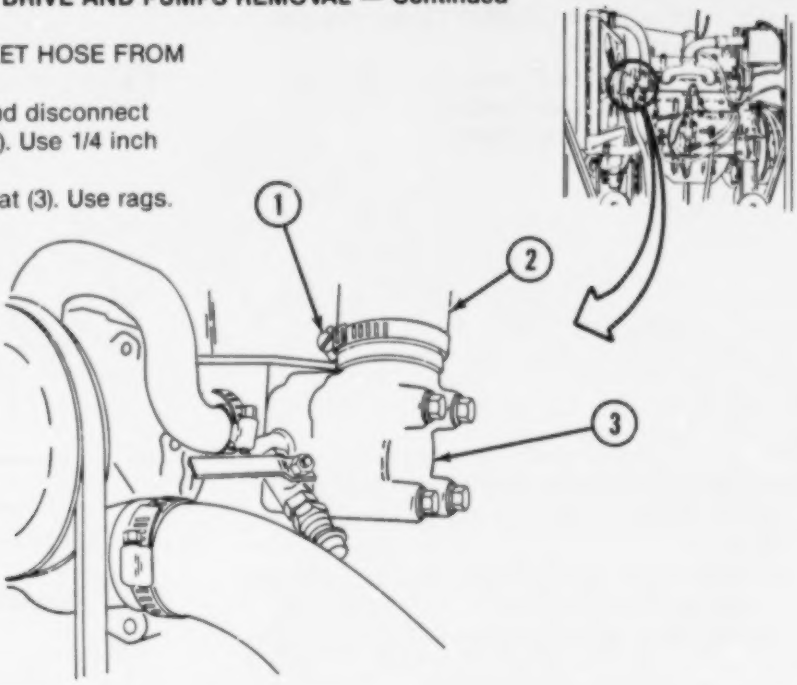
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

21. DISCONNECT ENGINE OUTLET HOSE FROM COOLANT THERMOSTAT.
    - Loosen clamp screw (1), and disconnect hose (2) from thermostat (3). Use 1/4 inch flat tip screwdriver.
    - Plug hose (2) and thermostat (3). Use rags.



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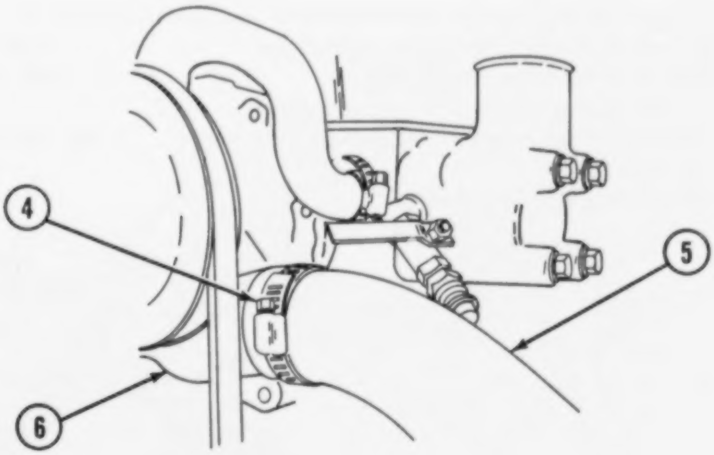
22. DISCONNECT ENGINE INLET HOSE FROM WATER PUMP.
    - Loosen clamp screw (4), and disconnect hose (5) from pump (6). Use 1/4 inch flat tip screwdriver.
    - Plug hose (5) and pump (6). Use rags.



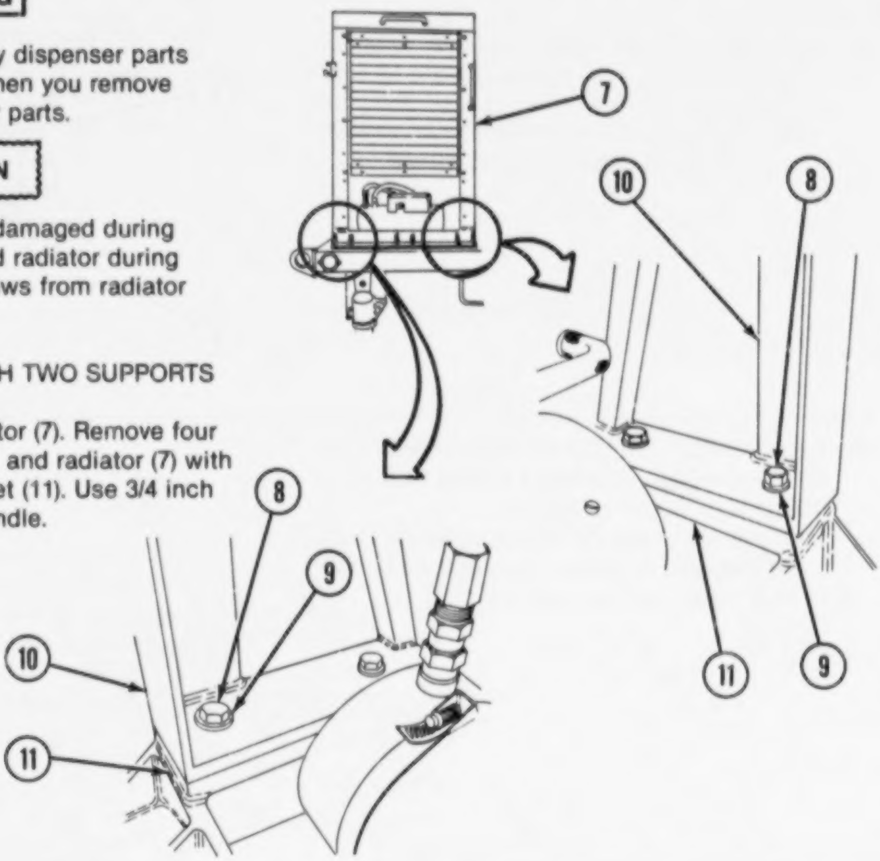
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

Radiator can fall and be damaged during removal. Have helper hold radiator during removal of mounting screws from radiator supports.

23. REMOVE RADIATOR WITH TWO SUPPORTS FROM ENGINE PALLET.
    - Have helper hold radiator (7). Remove four screws (8), washers (9), and radiator (7) with supports (10) from pallet (11). Use 3/4 inch socket with ratchet handle.



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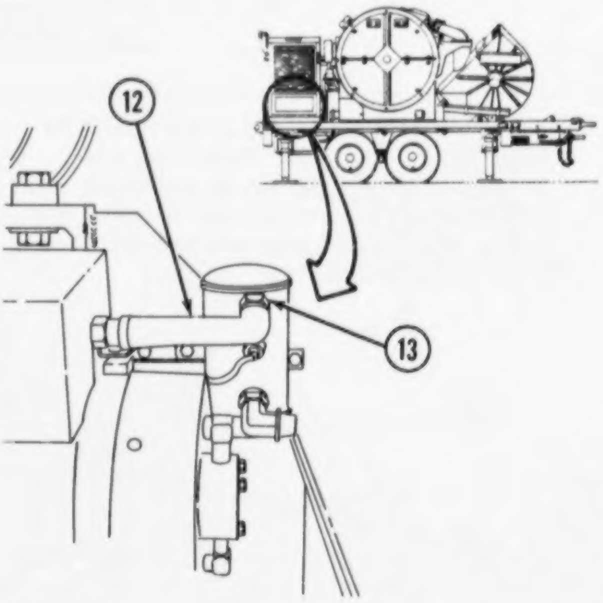
**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

24. REMOVE MOUNTING PLATE WITH COOLANT HEATER FUEL PUMP FROM ENGINE ASSEMBLY PALLET.
    - Disconnect fuel outlet hose (12) from adapter (13). Use 11/16 inch and 3/4 inch open end wrenches.
    - Plug hose, and cap adapter.



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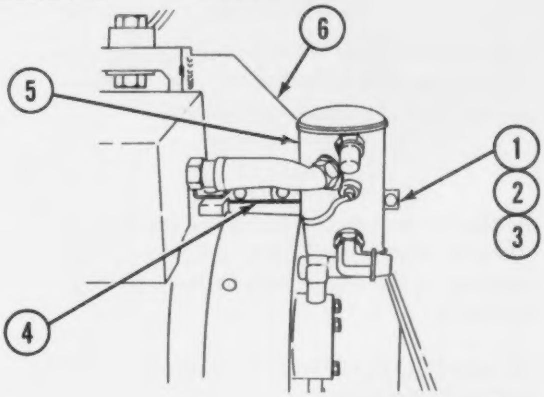
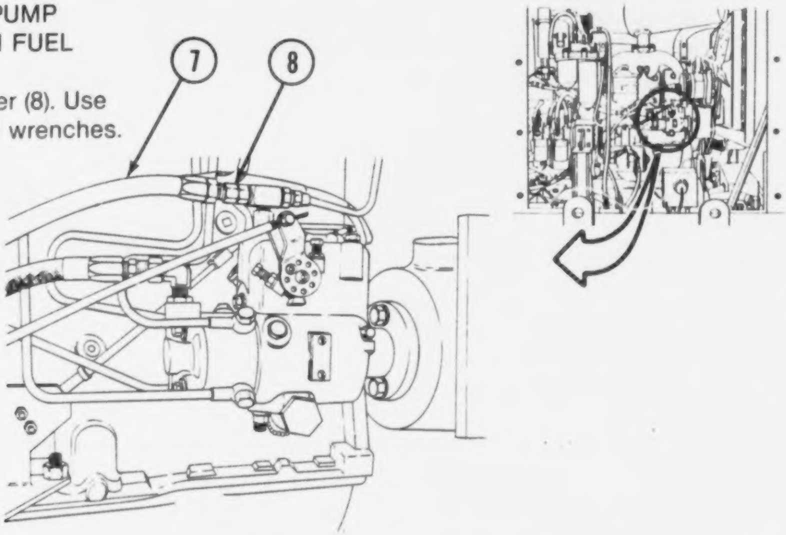
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

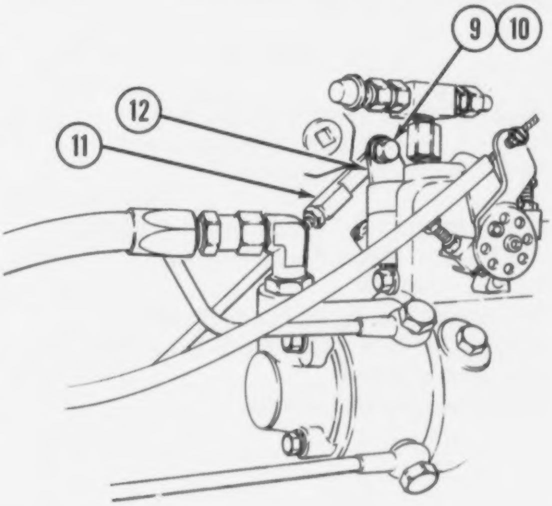
- Remove two self-locking nuts (1), washers (2), screws (3), and mounting plate (4) with fuel pump (5) from pallet (6). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard self-locking nuts.



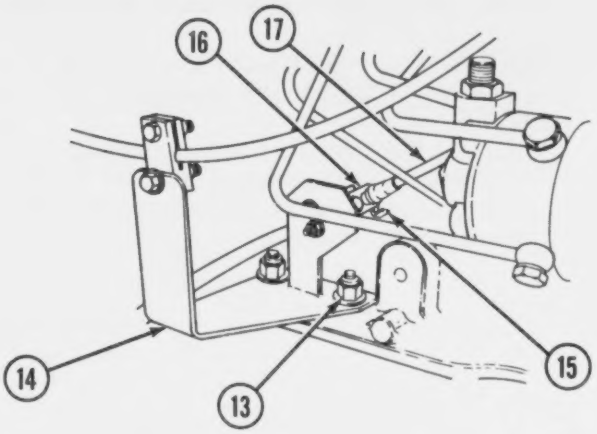
25. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM FUEL INJECTION PUMP ADAPTER.
    - Disconnect hose (7) from adapter (8). Use 1/2 inch and 9/16 inch open end wrenches.
    - Plug hose, and cap adapter.



26. REMOVE THROTTLE CABLE CLEVIS FROM FUEL INJECTION PUMP THROTTLE ARM.
    - Remove self-locking nut (9), screw (10), and clevis (11) from arm (12). Use 7/16 inch box end and 7/16 inch open end wrench. Discard self-locking nut.



27. REMOVE THROTTLE CABLE FROM PUMP END CABLE HOOK CLIP.
    - Loosen two nuts (13) on bracket (14). Use 9/16 inch open end wrench.
    - Pull bracket (14) away from engine.
    - Swing clip arm (15) from clip (16), and remove cable (17) from clip (16).
    - Pull cable (17) under engine.



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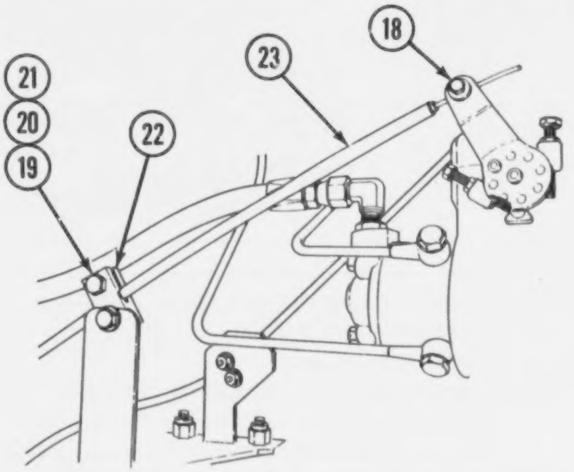
28. REMOVE FUEL CABLE FROM ENGINE.
    - Loosen screw (18). Use 1/4 inch flat tip screwdriver.
    - Remove self-locking nut (19), washer (20), and screw (21) from clamp (22). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle. Discard self-locking nut.
    - Spread clamp (22), and remove cable (23) from engine. Use 1/4 inch flat tip screwdriver.



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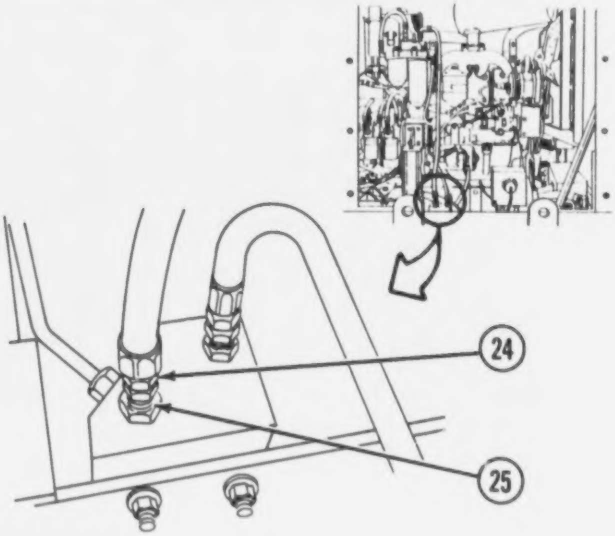
**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

29. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE FROM BULKHEAD ELBOW.
    - Disconnect hose (24) from elbow (25). Use 11/16 inch open end wrench.
    - Plug hose, and cap elbow.



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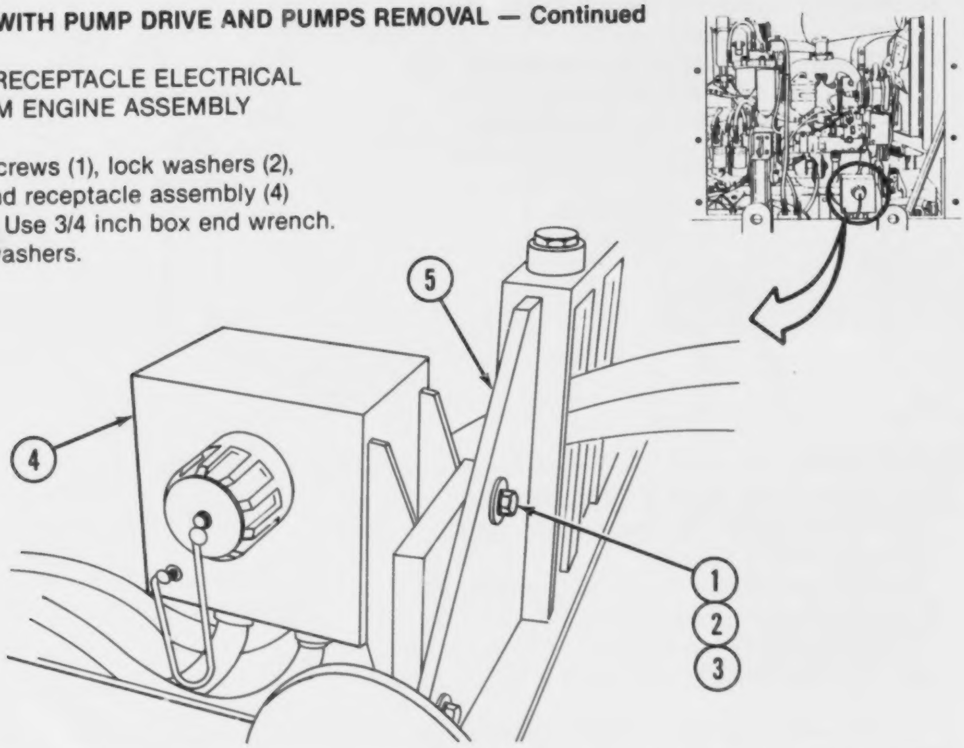
### A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

30. REMOVE NATO RECEPTACLE ELECTRICAL ASSEMBLY FROM ENGINE ASSEMBLY PALLET.
    - Remove two screws (1), lock washers (2), washers (3), and receptacle assembly (4) from pallet (5). Use 3/4 inch box end wrench. Discard lock washers.



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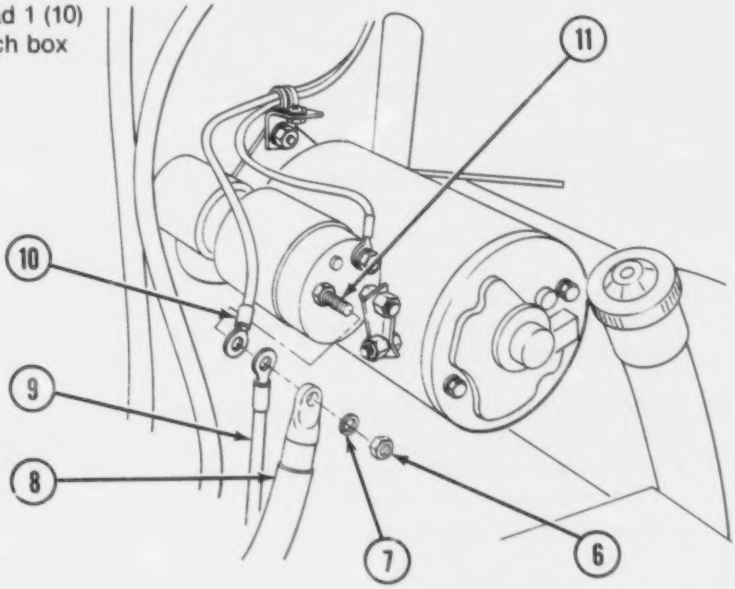
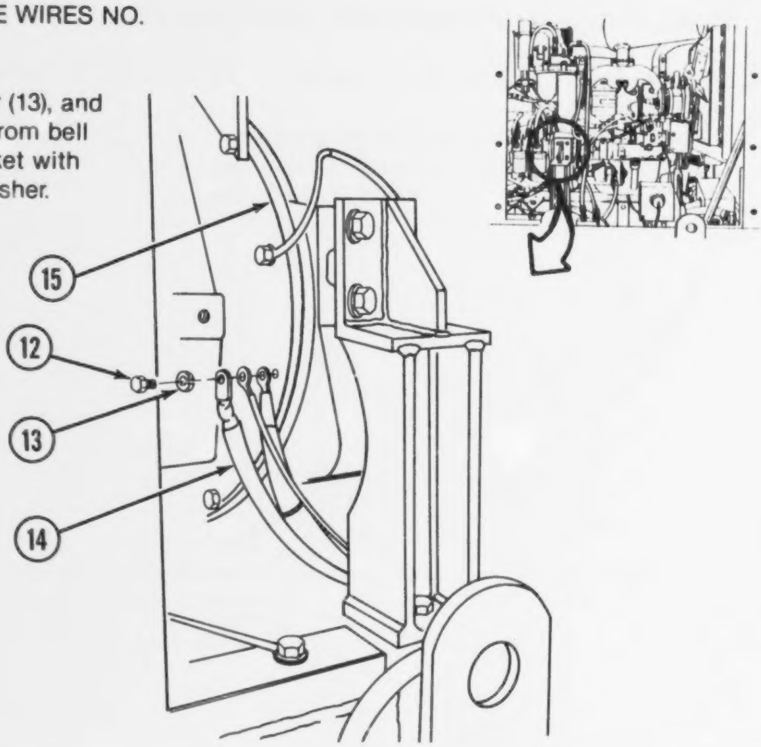
31. REMOVE LEADS FROM LARGE TERMINAL OF STARTER SOLENOID.
    - Tag and mark leads.
    - Remove nut (6), lock washer (7), NATO Receptacle Lead 1 (8), Power Panel Lead 1 (9), and Engine Wiring Harness Lead 1 (10) from large terminal (11). Use 5/8 inch box end wrench. Discard lock washer.



32. REMOVE THREE GROUND CABLE WIRES NO. 2 FROM BELL HOUSING.
    - Tag and mark leads.
    - Remove screw (12), lock washer (13), and three Ground Wires No. 2 (14) from bell housing (15). Use 9/16 inch socket with ratchet handle. Discard lock washer.



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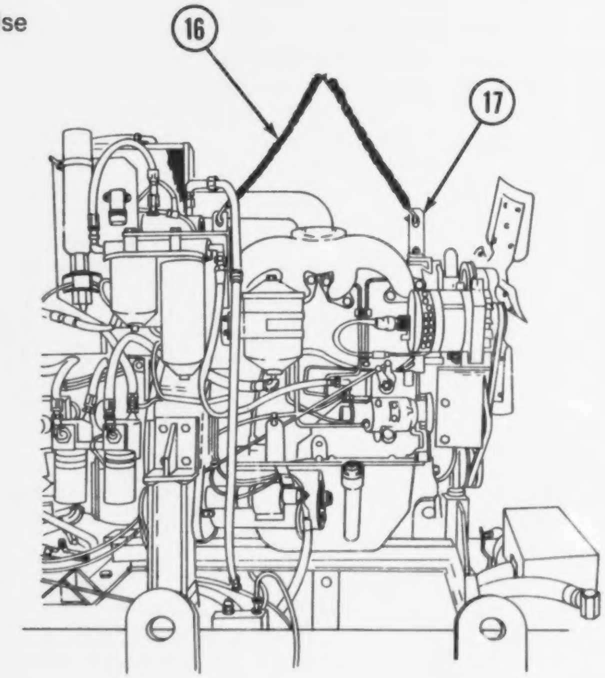
33. ATTACH ENGINE AND TRANSMISSION SLING TO DIESEL ENGINE.
    - Attach sling (16) to two lifting eyes (17). Use engine and transmission sling.
    - Take up slack in sling (16). Use hoist.



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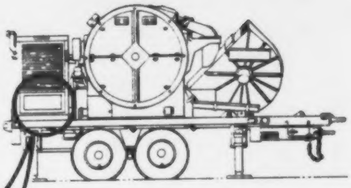
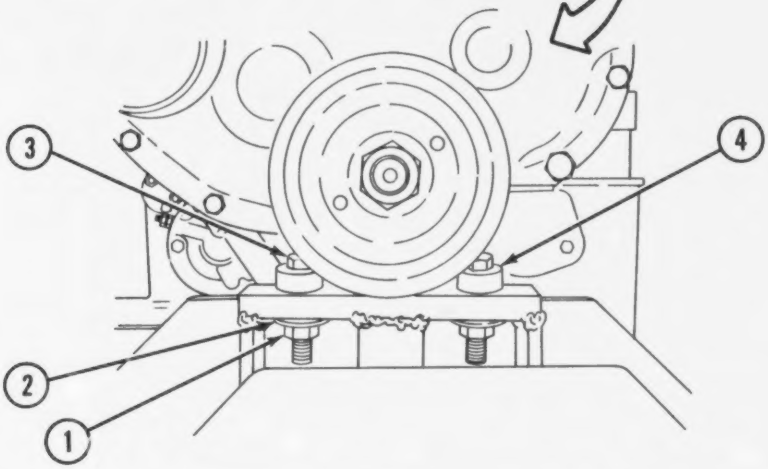
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

34. REMOVE TWO SCREWS FROM FRONT ENGINE SUPPORT.
    - Remove two self-locking nuts (1), washers (2), and screws (3) from support (4). Use two 15/16 inch open end wrenches. Discard self-locking nuts.





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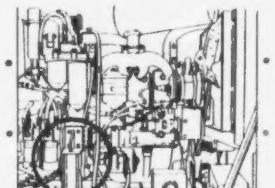
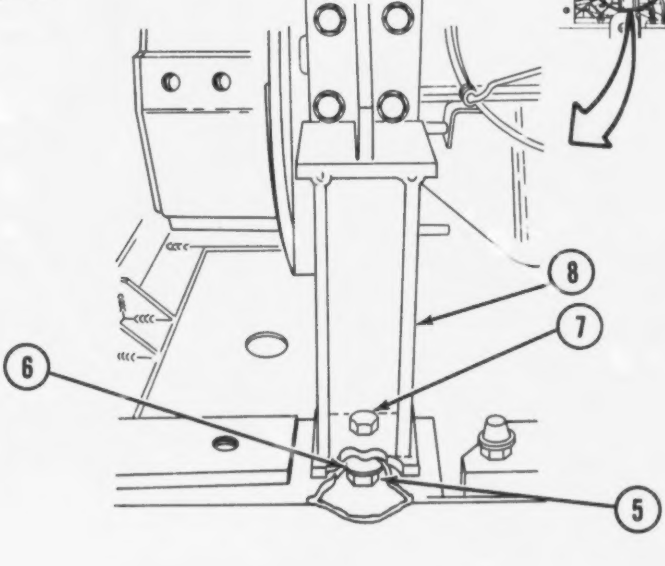
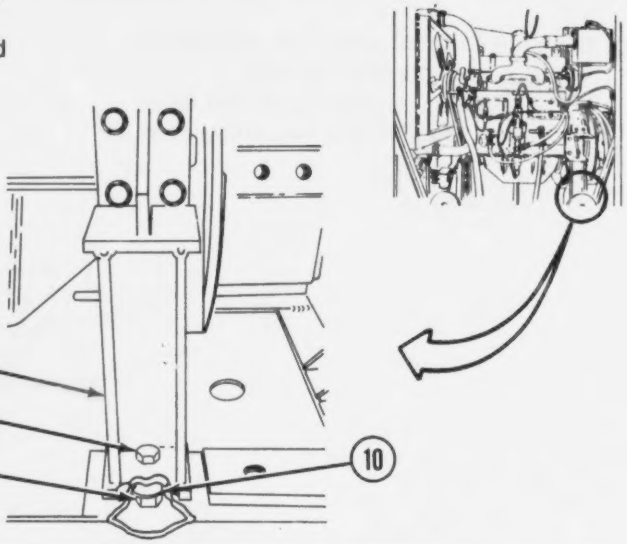
35. REMOVE RIGHT SIDE SUPPORT SCREW FROM ENGINE ASSEMBLY PALLET.
    - Remove self-locking nut (5), washer (6), and screw (7) from right side support (8). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle. Discard self-locking nut.





36. REMOVE LEFT SIDE SUPPORT SCREW FROM ENGINE ASSEMBLY PALLET.
    - Remove self-locking nut (9), washer (10), and screw (11) from left side support (12). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle. Discard self-locking nut.



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**WARNING**

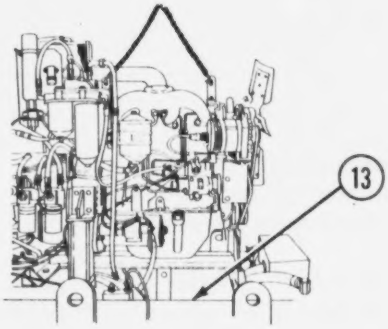
Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment when power unit is being removed or installed.

**CAUTION**

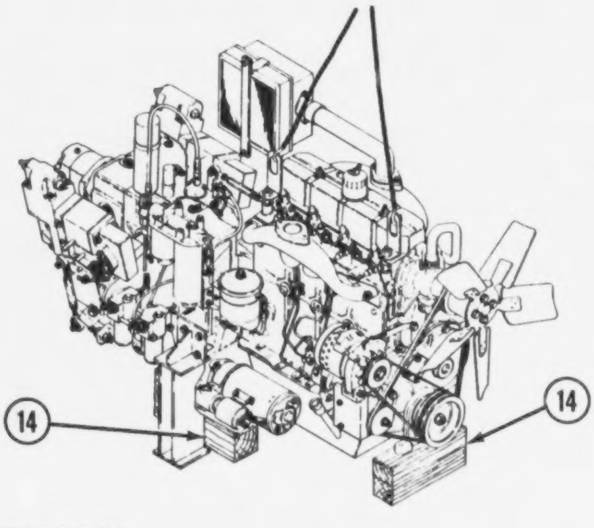
Engine, mechanical, electrical, oil, hydraulic, fuel, and coolant connections can be damaged during engine removal. Disconnect connections before hoisting engine.

• • • •

Prevent equipment damage. Have helper guide engine when removing engine from dispenser.



37. REMOVE DIESEL ENGINE WITH PUMP DRIVE AND PUMPS FROM ENGINE ASSEMBLY PALLET.
    - Have helper guide engine. Remove engine from pallet (13), and place engine on wood blocks (14) on floor. Use hoist with engine and transmission sling.



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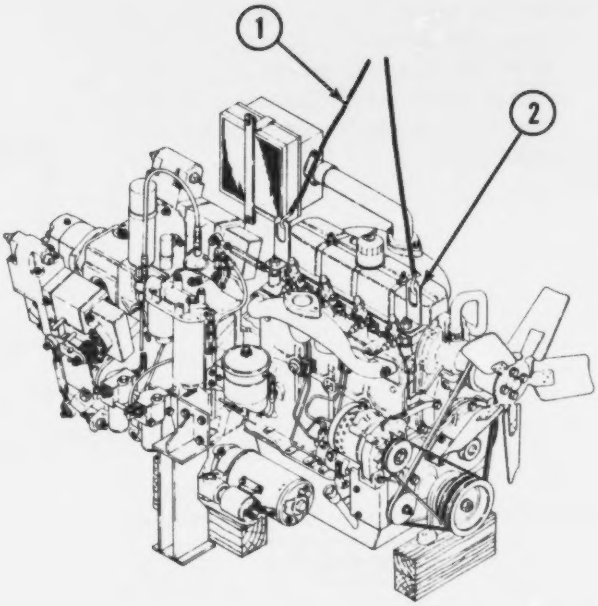
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

38. REMOVE ENGINE AND TRANSMISSION SLING FROM DIESEL ENGINE.
    - Release tension in sling (1). Use hoist.
    - Remove sling (1) from two lifting eyes (2).



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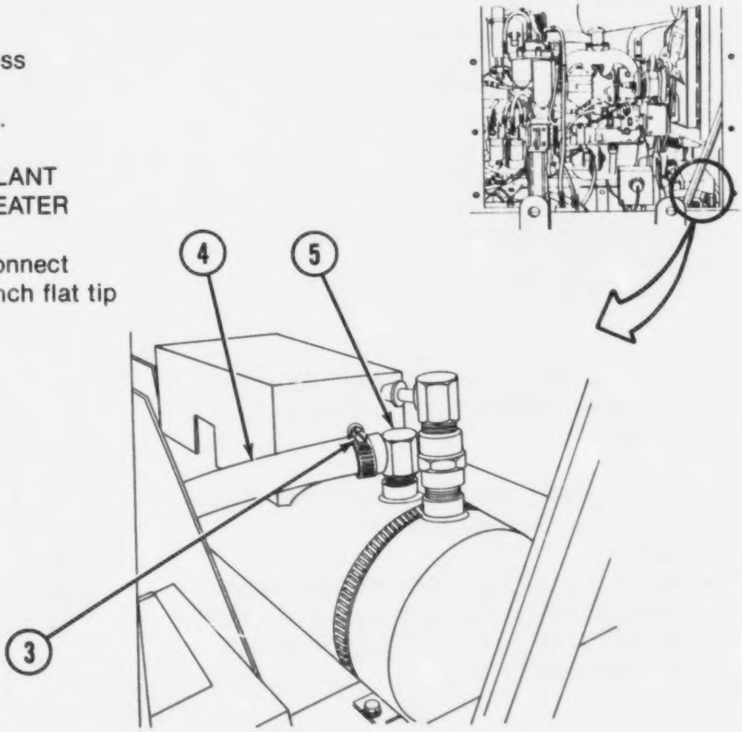
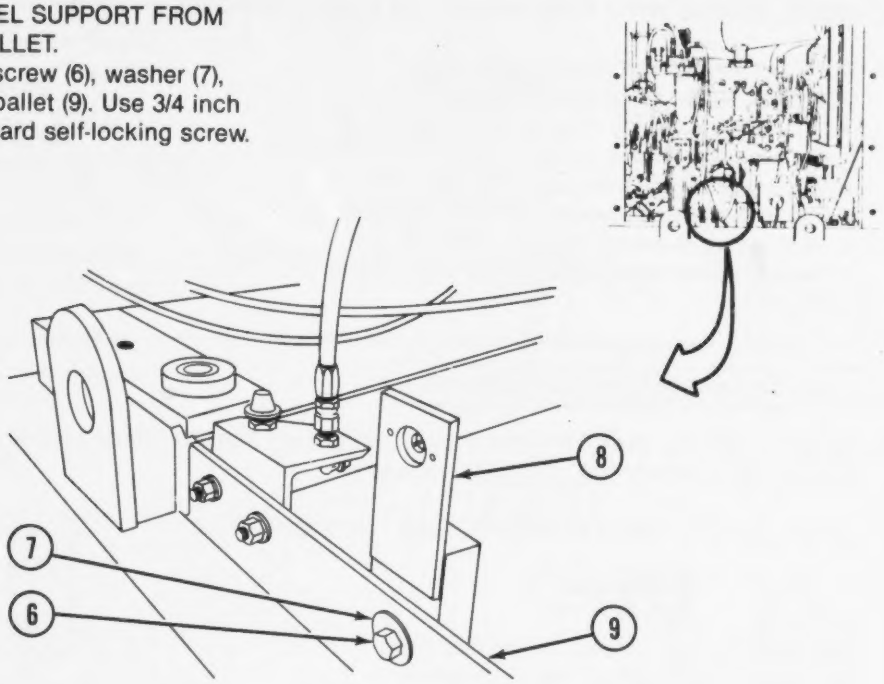
**NOTE**

Do not perform steps 39 thru 42 unless required for maintenance or you are removing the engine assembly pallet.

39. DISCONNECT BATTERY NO. 1 COOLANT RETURN HOSE FROM COOLANT HEATER FITTING.
    - Loosen clamp screw (3), and disconnect hose (4) from fitting (5). Use 5/16 inch flat tip screwdriver.
    - Plug hose, and cap fitting.



40. REMOVE HINGED PANEL SUPPORT FROM ENGINE ASSEMBLY PALLET.
    - Remove self-locking screw (6), washer (7), and support (8) from pallet (9). Use 3/4 inch box end wrench. Discard self-locking screw.



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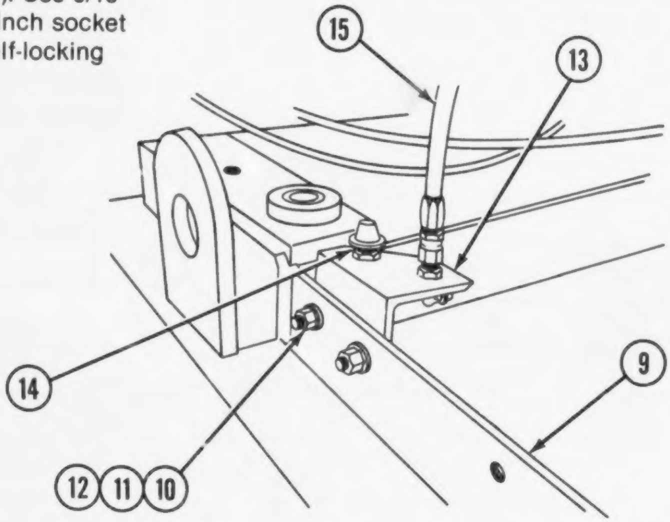
41. REMOVE ENGINE PALLET RIGHT FUEL LINE BRACKET WITH ELBOW AND FUEL INJECTION RETURN HOSE ASSEMBLY FROM ENGINE ASSEMBLY PALLET.
    - Remove two self-locking nuts (10), washers (11), screws (12), and bracket (13) with elbow (14) and hose (15) from pallet (9). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle. Discard self-locking nuts.



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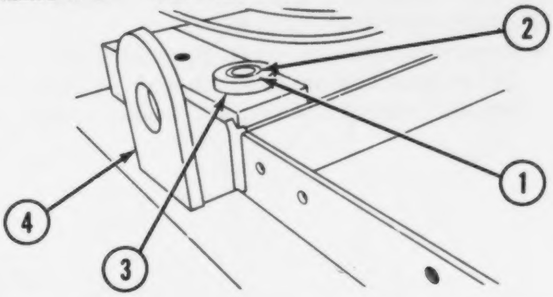
## A. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS REMOVAL — Continued

42. REMOVE RIGHT AND LEFT RESILIENT MOUNTS FROM ENGINE ASSEMBLY PALLET.
    - Cut rubber (1) away from bushing (2) on right mount (3). Use pocket knife.
    - Drive bushing (2) from pallet (4). Use 3/4 inch drive pin punch and ball peen hammer.
    - Remove right mount (3) from pallet (4).
    - Repeat above removal steps for left resilient mount.



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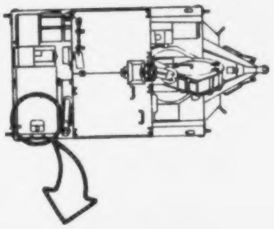
## B. ENGINE ASSEMBLY PALLET REMOVAL

1. REMOVE DIESEL ENGINE WITH PUMP DRIVE AND PUMPS FROM ENGINE ASSEMBLY PALLET. (SEE ENGINE ASSEMBLY PALLET, PAGE 15-448.)

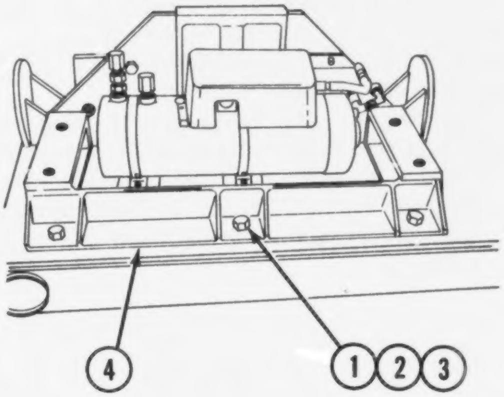
2. LOWER SPARE TIRE AND WHEEL. (SEE TM 9-1095-205-10.)

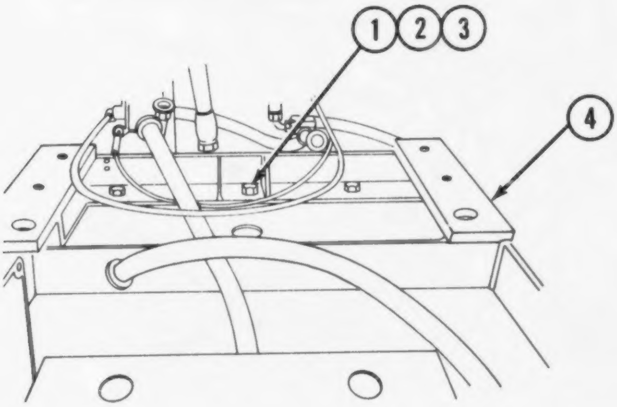


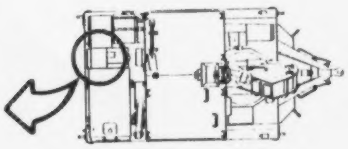
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

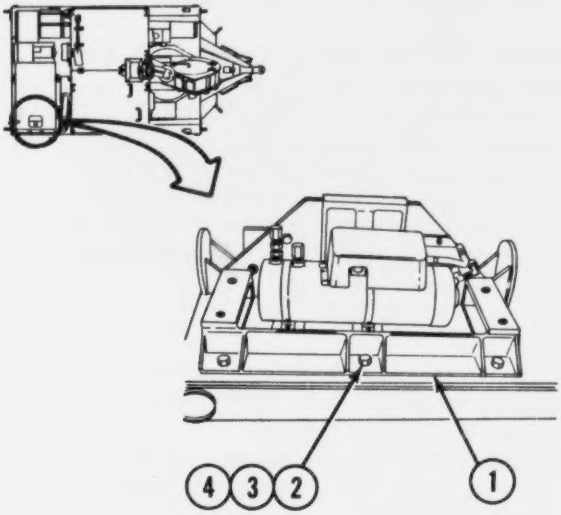
3. REMOVE ENGINE ASSEMBLY PALLET FROM CHASSIS.
   - Remove six screws (1), washers (2), and self-locking nuts (3) from pallet (4). Use 1 1/8 inch box end wrench and 1 1/8 inch socket with 10 inch extension and ratchet handle. Discard self-locking nuts.
   - Remove pallet (4) from chassis. Use helper.







## C. ENGINE ASSEMBLY PALLET INSTALLATION



NOTE

***PRELIMINARY PROCEDURES:***

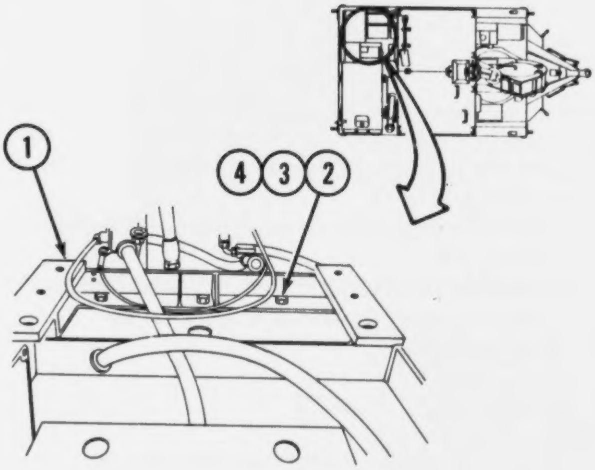
Remove Eight Splined Self-Locking Nuts. (See Engine Assembly Top and Supports, TM 9-1095-205-20.)

Repair Engine Assembly Pallet. (See Engine Assembly Top and Supports, TM 9-1095-205-20.)

Install Eight New Splined Self-Locking Nuts. (See Engine Assembly Top and Supports, TM 9-1095-205-20.)

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.



1. INSTALL ENGINE ASSEMBLY PALLET ON CHASSIS.
   - Position pallet (1) on chassis with mounting holes alined. Use aligning punch. Use helper.
   - Install pallet (1), six washers (2), screws (3), and new self-locking nuts (4) on chassis. Use 1 1/8 inch box end wrench and 1 1/8 inch socket with 10 inch extension and ratchet handle.

2. RAISE SPARE TIRE AND WHEEL. (SEE TM 9-1095-205-10.)

3. INSTALL DIESEL ENGINE WITH PUMP DRIVE AND PUMPS ON ENGINE ASSEMBLY PALLET. (SEE ENGINE ASSEMBLY PALLET, PAGE 15-467.)

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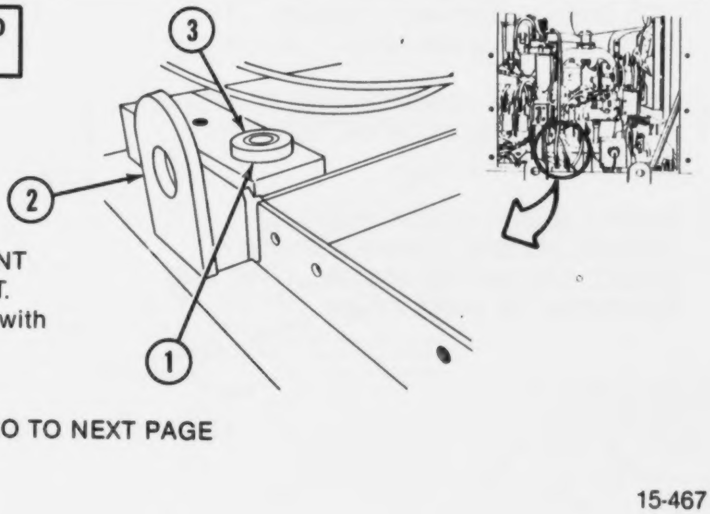
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION



NOTE

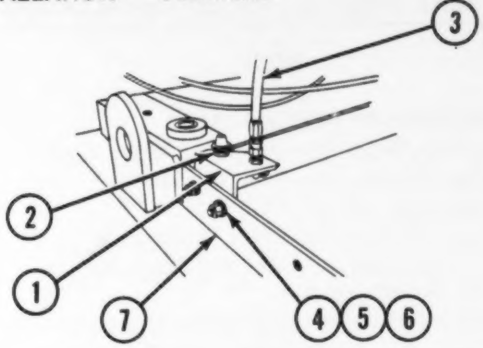
If engine assembly pallet was not removed, go to step 5.

1. INSTALL NEW RIGHT AND LEFT RESILIENT MOUNTS ON ENGINE ASSEMBLY PALLET.
   - Install new right mount (1) on pallet (2), with large end (3) on top.
   - Repeat above installation step for left resilient mount.

GO TO NEXT PAGE

## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

2. INSTALL ENGINE PALLET RIGHT FUEL LINE BRACKET WITH ELBOW AND FUEL INJECTION RETURN HOSE ASSEMBLY ON ENGINE ASSEMBLY PALLET.
   - Install bracket (1) with elbow (2) and hose (3), two washers (4), screws (5), and new self-locking nuts (6) on pallet (7). Use 9/16 inch box end wrench and 9/16 inch socket with ratchet handle.



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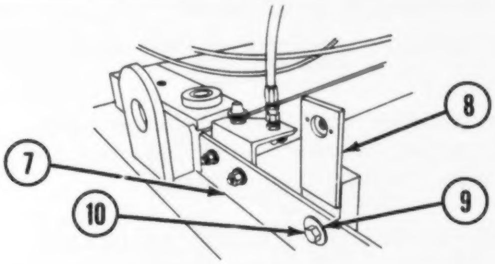
3. INSTALL HINGED PANEL SUPPORT ON ENGINE ASSEMBLY PALLET.
   - Install support (8), washer (9), and new self-locking screw (10) on pallet (7). Use 3/4 inch box end wrench.



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4. CONNECT BATTERY NO. 1 COOLANT RETURN HOSE TO COOLANT HEATER FITTING.
   - Remove plug and cap from hose (11) and fitting (12).
   - Connect hose (11) to fitting (12), and tighten clamp screw (13). Use 5/16 inch flat tip screwdriver.

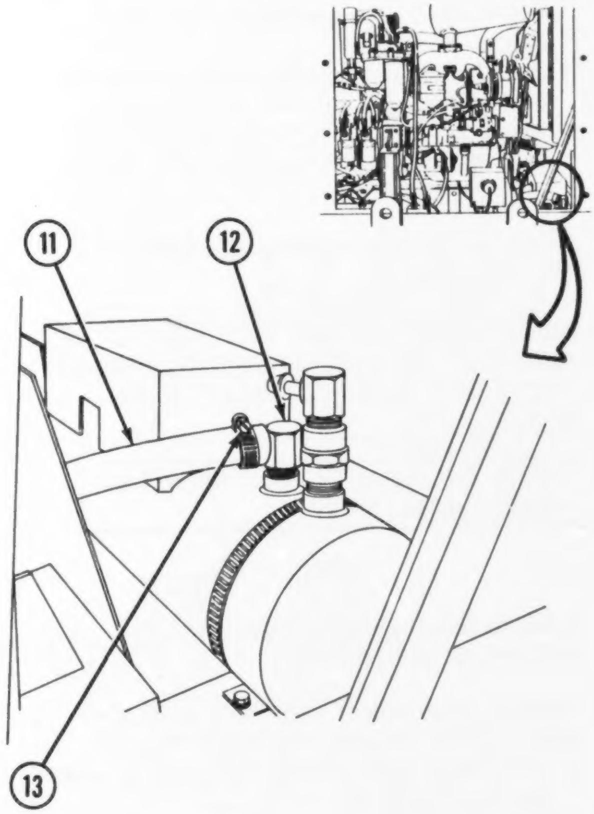
**NOTE**

If engine assembly pallet was removed, go to step 8.

5. REMOVE EIGHT SPLINED SELF-LOCKING NUTS FROM ENGINE ASSEMBLY PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

6. REPAIR ENGINE ASSEMBLY PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

7. INSTALL EIGHT NEW SPLINED SELF-LOCKING NUTS IN ENGINE ASSEMBLY PALLET. (SEE ENGINE ASSEMBLY TOP AND SUPPORTS, TM 9-1095-205-20.)

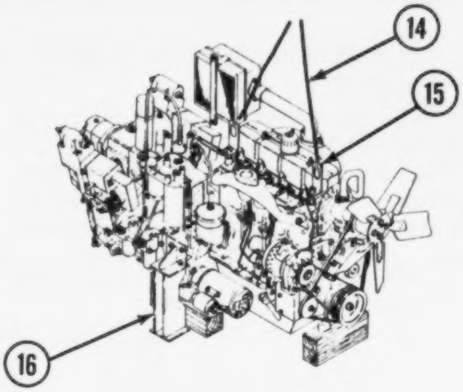


**WARNING**

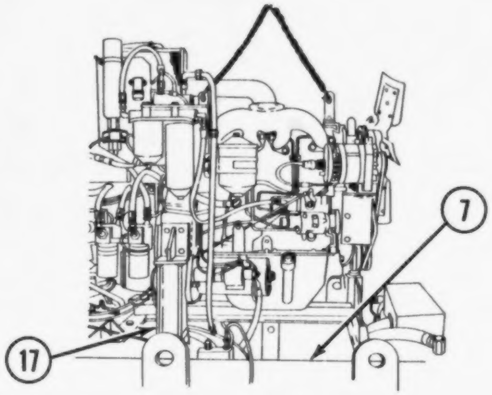
Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment when power unit is being removed or installed.

**CAUTION**

Prevent equipment damage. Have helper guide and position engine on engine assembly pallet.



8. POSITION DIESEL ENGINE WITH PUMP DRIVE AND PUMPS ON ENGINE ASSEMBLY PALLET.
   - Attach engine and transmission sling (14) to two lifting eyes (15).
   - Lift diesel engine with pump drive and pumps, and position on pallet (7) with left and right side supports (16) (17) and front engine mounting holes alined. Use hoist. Use helper.



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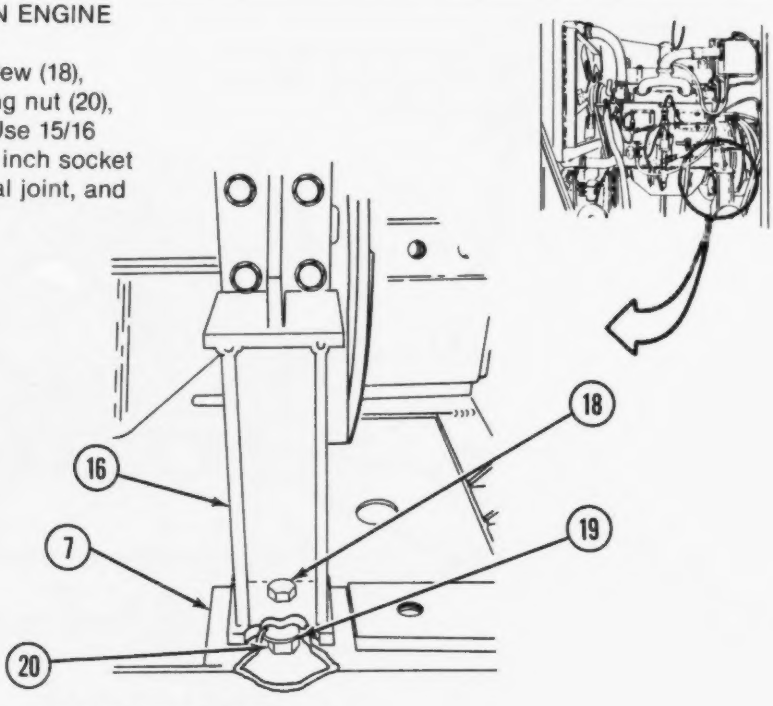
9. INSTALL LEFT SIDE SUPPORT ON ENGINE ASSEMBLY PALLET.
   - Install left side support (16), screw (18), washer (19), and new self-locking nut (20), on engine assembly pallet (7). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle. Do not tighten.



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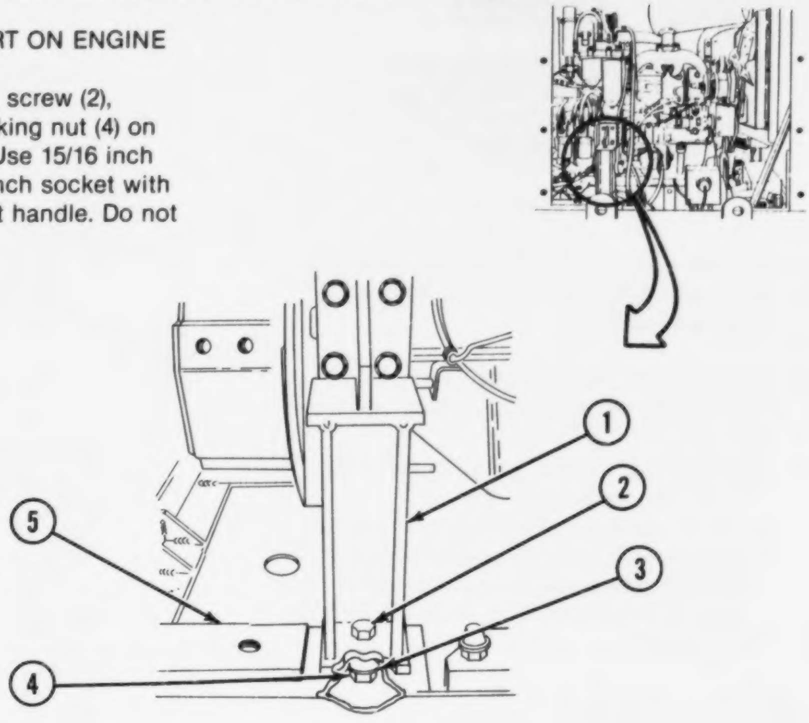
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

10. INSTALL RIGHT SIDE SUPPORT ON ENGINE ASSEMBLY PALLET.
    - Install right side support (1), screw (2), washer (3), and new self-locking nut (4) on engine assembly pallet (5). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle. Do not tighten.



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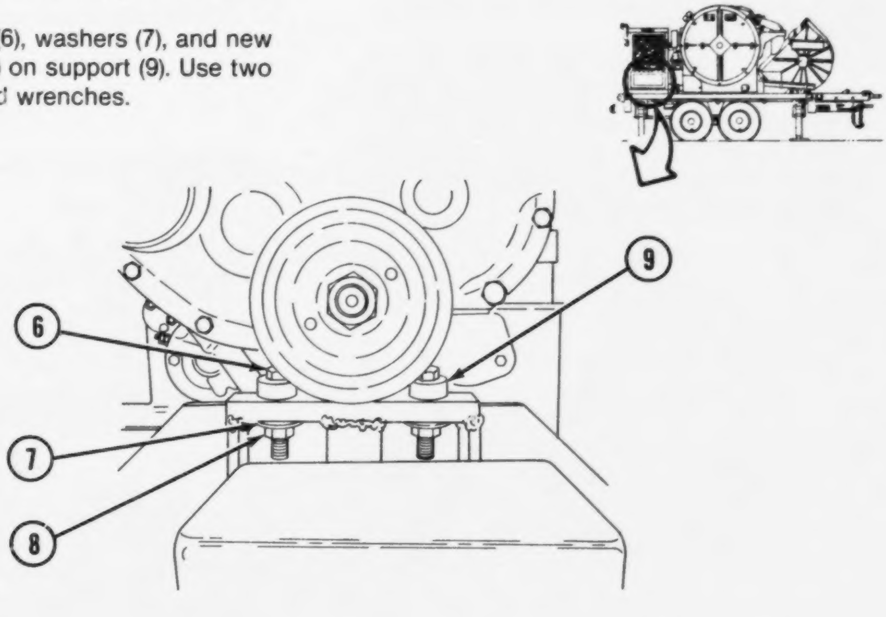
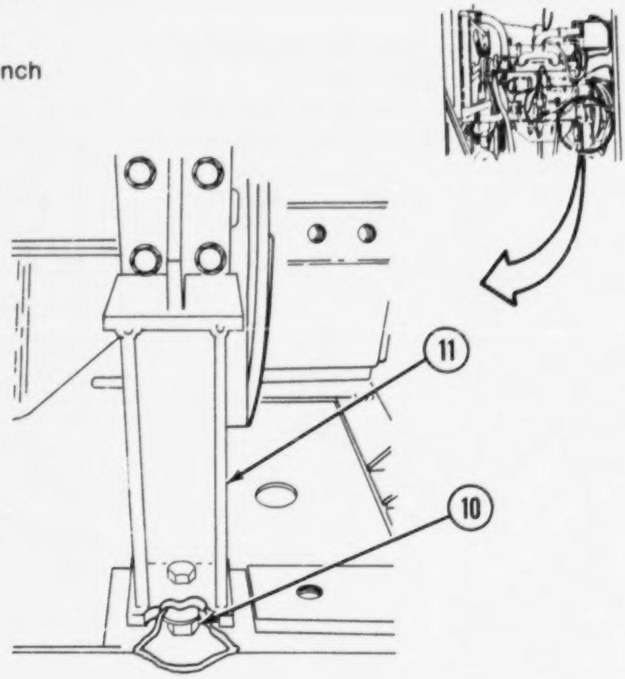
11. INSTALL TWO SCREWS ON FRONT ENGINE SUPPORT.
    - Install two screws (6), washers (7), and new self-locking nuts (8) on support (9). Use two 15/16 inch open end wrenches.



12. TIGHTEN SELF-LOCKING NUT ON LEFT SIDE SUPPORT.
    - Tighten self-locking nut (10) on left side support (11). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle.



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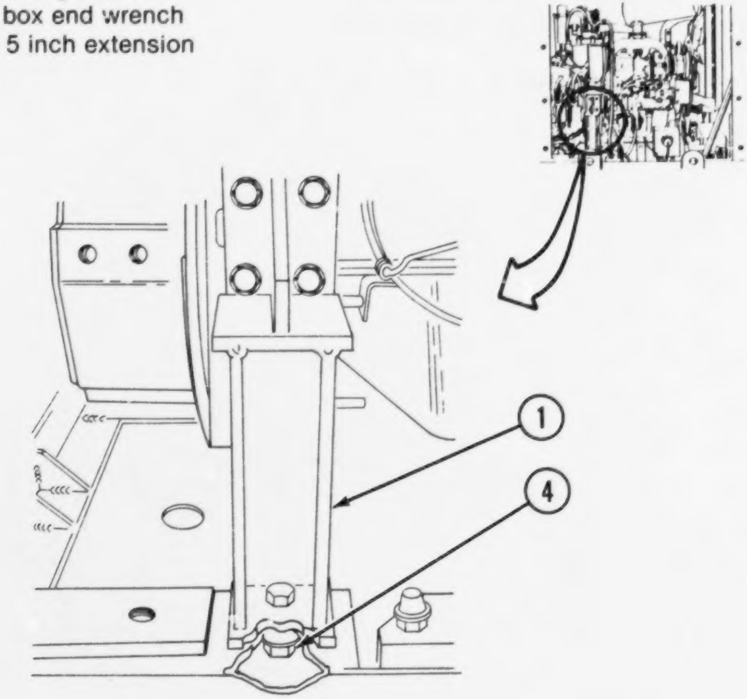
13. TIGHTEN SELF-LOCKING NUT ON RIGHT SIDE SUPPORT.
    - Tighten self-locking nut (4) on right side support (1). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle.



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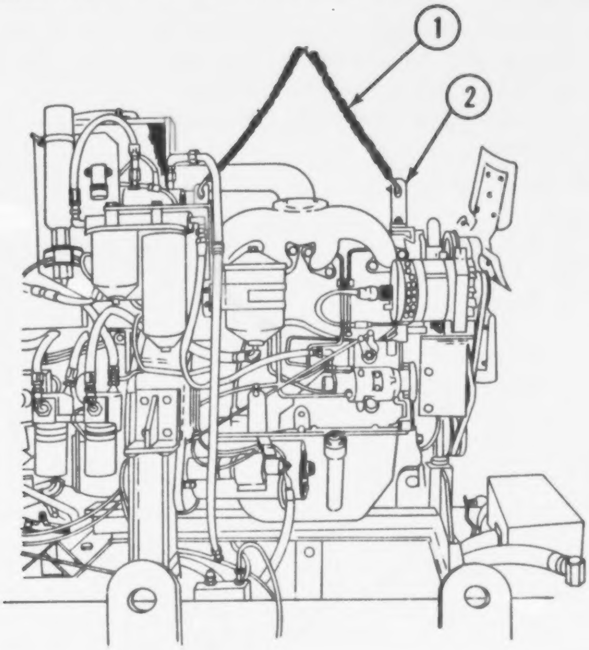
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

14. REMOVE ENGINE AND TRANSMISSION SLING FROM DIESEL ENGINE.
    - Release tension in sling (1). Use hoist.
    - Remove sling (1) from two lifting eyes (2).



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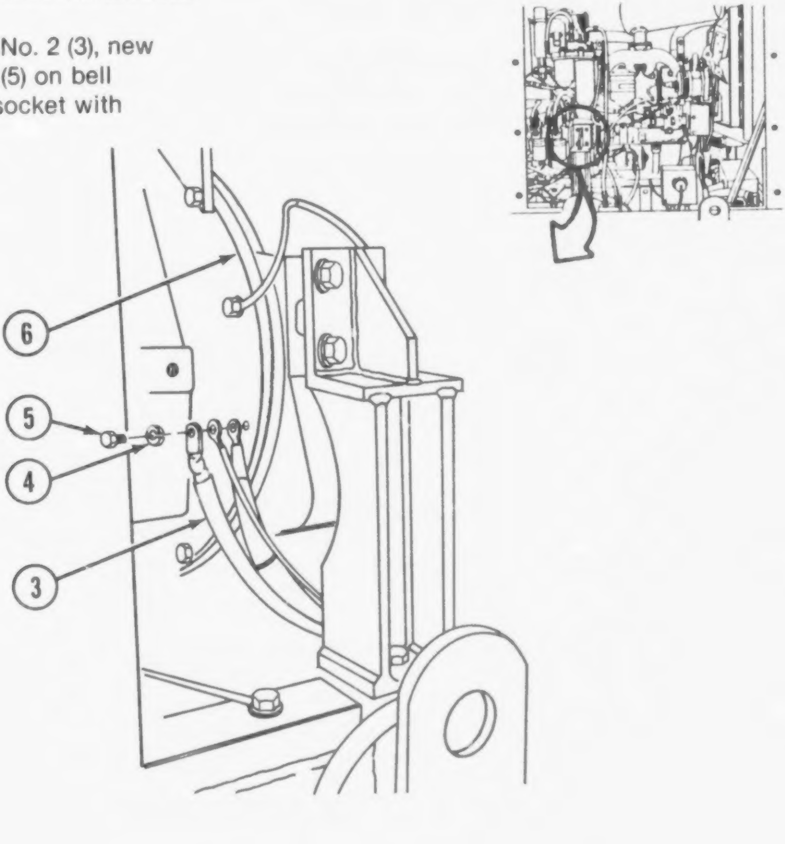
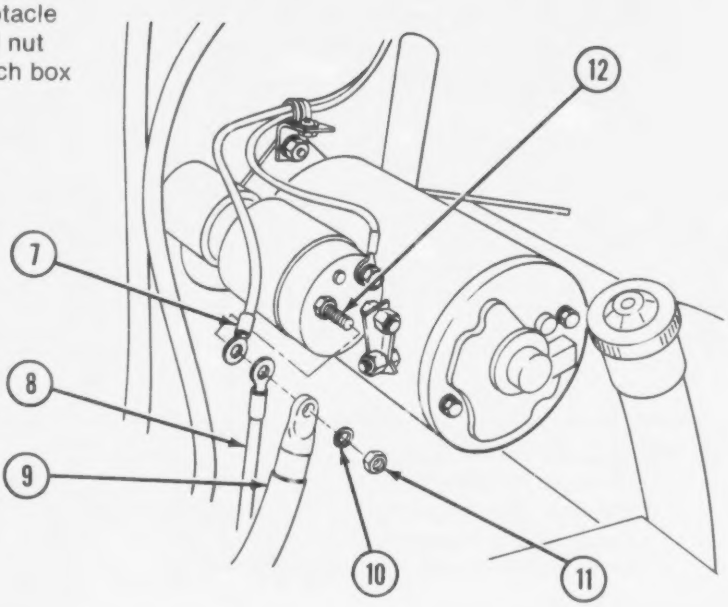
15. INSTALL THREE GROUND CABLE WIRES NO. 2 ON BELL HOUSING.
    - Install three Ground Wires No. 2 (3), new lock washer (4), and screw (5) on bell housing (6). Use 9/16 inch socket with ratchet handle.
    - Remove tags from leads.



16. INSTALL LEADS ON LARGE TERMINAL OF STARTER SOLENOID.
    - Install Engine Wiring Harness Lead 1 (7), Power Panel Lead 1 (8), NATO Receptacle Lead 1 (9), new lock washer (10), and nut (11) on large terminal (12). Use 5/8 inch box end wrench.
    - Remove tags from leads.



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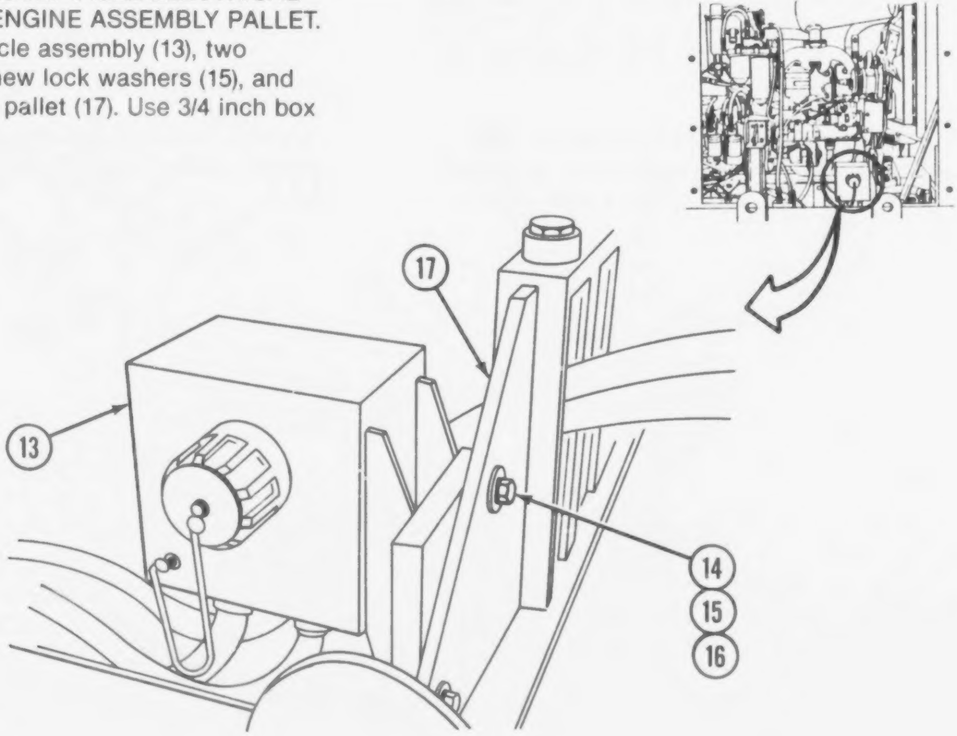
17. INSTALL NATO RECEPTACLE ELECTRICAL ASSEMBLY ON ENGINE ASSEMBLY PALLET.
    - Install receptacle assembly (13), two washers (14), new lock washers (15), and screws (16) on pallet (17). Use 3/4 inch box end wrench.



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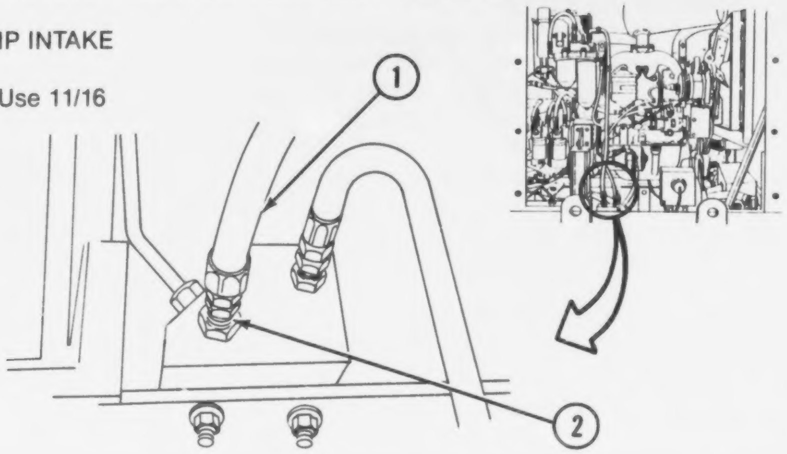
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

18. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE TO BULKHEAD ELBOW.
    - Connect hose (1) to elbow (2). Use 11/16 inch open end wrench.



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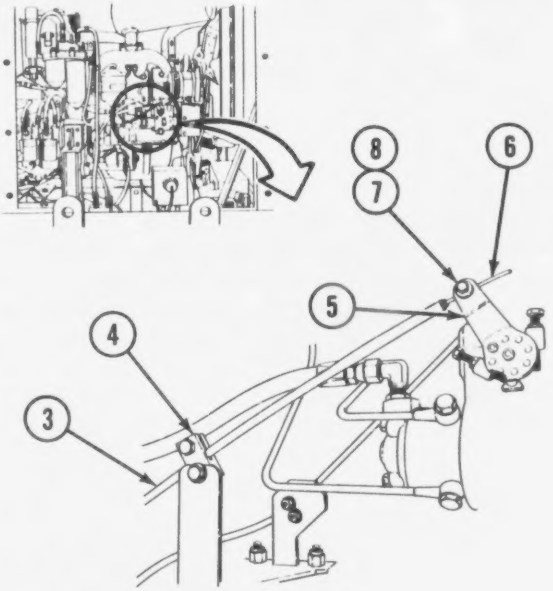
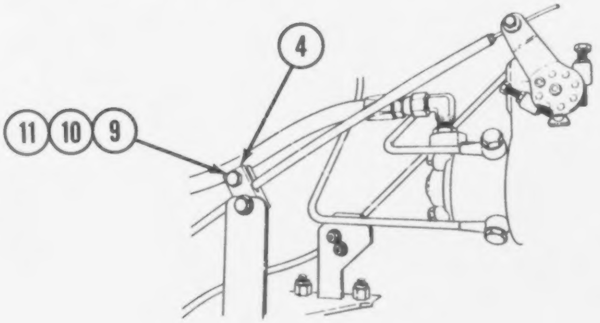
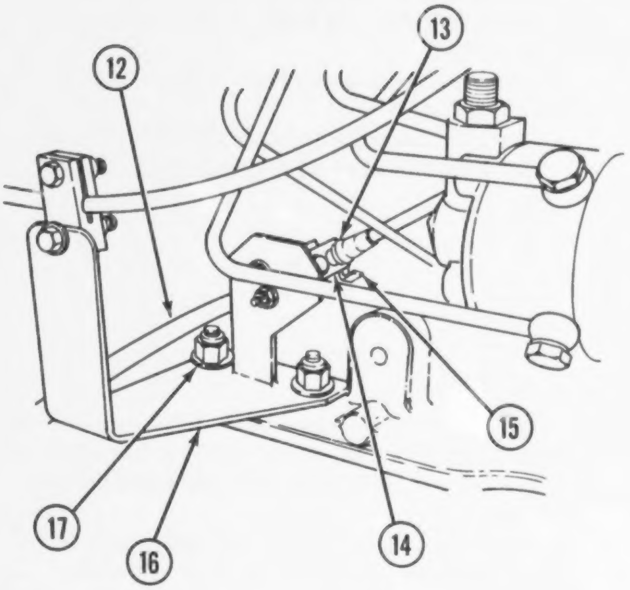
19. INSTALL FUEL CABLE ON ENGINE.
    - Pull cable (3) from under engine.
    - Push 9 in. (22.9 cm) of cable (3) through clamp (4). Use measuring tape.
    - Pull fuel control arm (5) toward left side of dispenser.
    - Install cable end (6) in control arm clamp (7). Do not tighten screw (8).
    - Install screw (9), washer (10), and new self-locking nut (11) on clamp (4). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle.

20. ADJUST FUEL CONTROL LINKAGE. (SEE ENGINE GOVERNOR AND FUEL SHUTOFF CONTROL ASSEMBLY, TM 9-1095-205-20.)





21. INSTALL THROTTLE CABLE IN PUMP END CABLE HOOK CLIP.
    - Route cable (12) under bellhousing and up between starter and engine block.
    - Install slotted cable fitting (13) into hook clip (14).
    - Move clip arm (15) over cable fitting (13).
    - Push bracket (16) all the way towards engine.
    - Tighten two nuts (17). Use 9/16 inch open end wrench.



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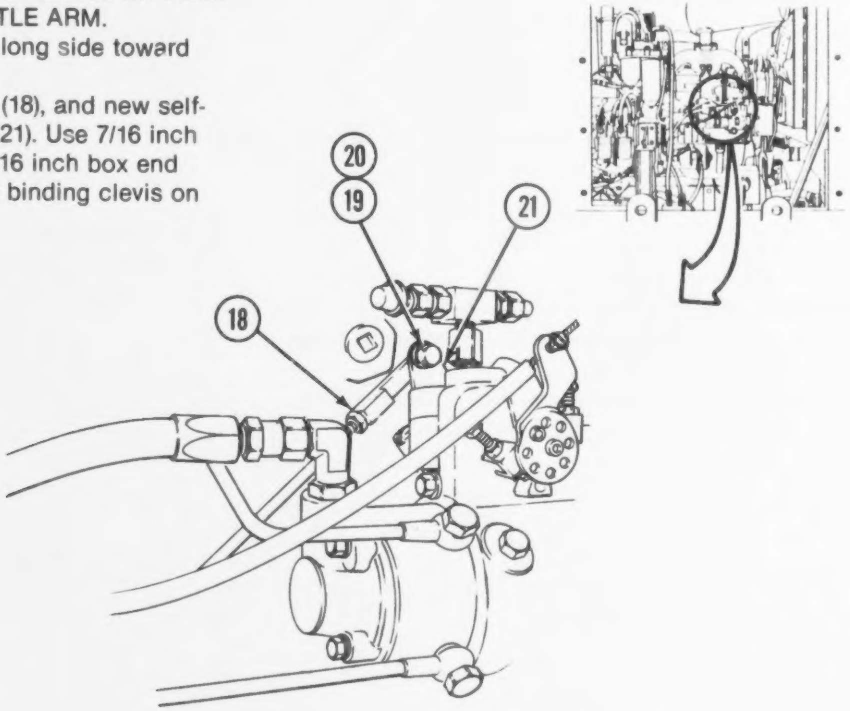
22. INSTALL THROTTLE CABLE CLEVIS ON FUEL INJECTION PUMP THROTTLE ARM.
    - Position clevis (18) with long side toward engine.
    - Install screw (19), clevis (18), and new self-locking nut (20) on arm (21). Use 7/16 inch open end wrench and 7/16 inch box end wrench. Tighten without binding clevis on arm.



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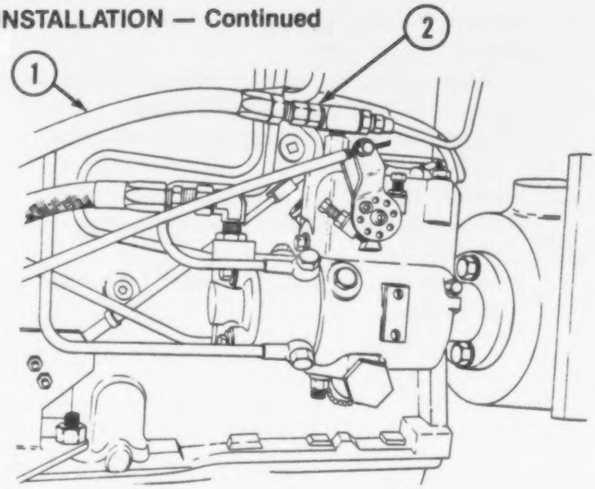
### D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

23. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL INJECTION PUMP ADAPTER.
    - Remove plug and cap from hose (1) and adapter (2).
    - Connect hose (1) to adapter (2). Use 1/2 inch and 9/16 inch open end wrenches.



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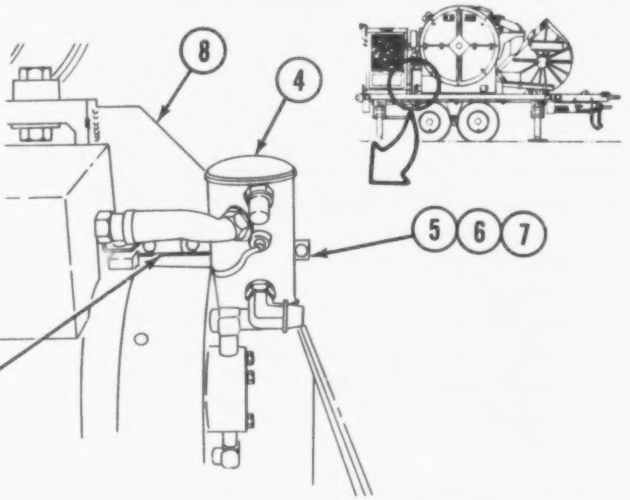
24. INSTALL MOUNTING PLATE WITH COOLANT HEATER FUEL PUMP ON ENGINE ASSEMBLY PALLET.
    - Install mounting plate (3) with fuel pump (4), two washers (5), screws (6), and new self-locking nuts (7) on pallet (8). Use 7/16 inch box end wrench and 7/16 inch socket with ratchet handle.



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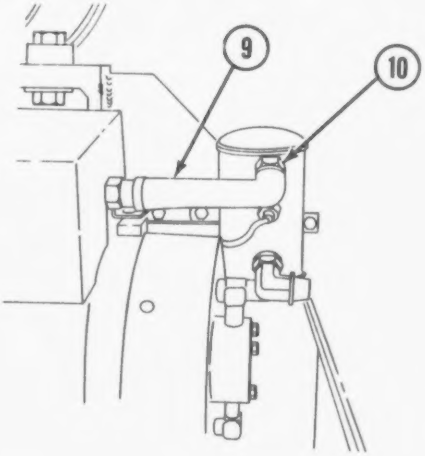
- Remove plug and cap from fuel outlet hose (9) and adapter (10).
- Connect fuel outlet hose (9) to adapter (10). Use 11/16 inch and 3/4 inch open end wrenches.



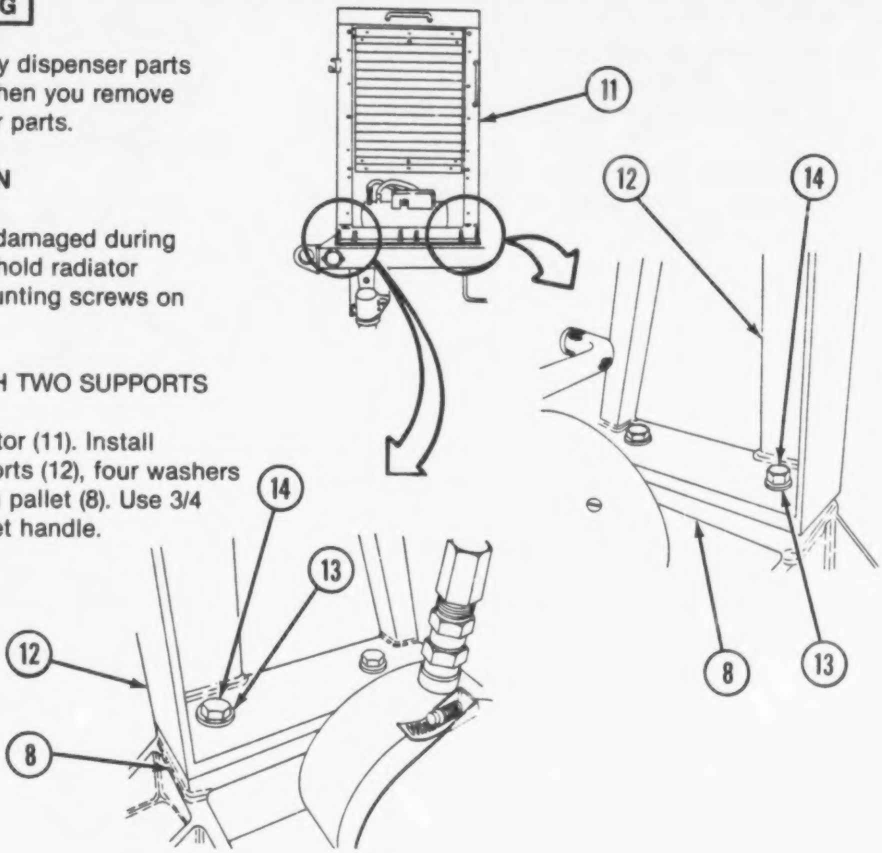
**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

Radiator can fall and be damaged during installation. Have helper hold radiator during installation of mounting screws on radiator supports.

25. INSTALL RADIATOR WITH TWO SUPPORTS ON PALLET.
    - Have helper hold radiator (11). Install radiator (11) with supports (12), four washers (13), and screws (14) on pallet (8). Use 3/4 inch socket with ratchet handle.



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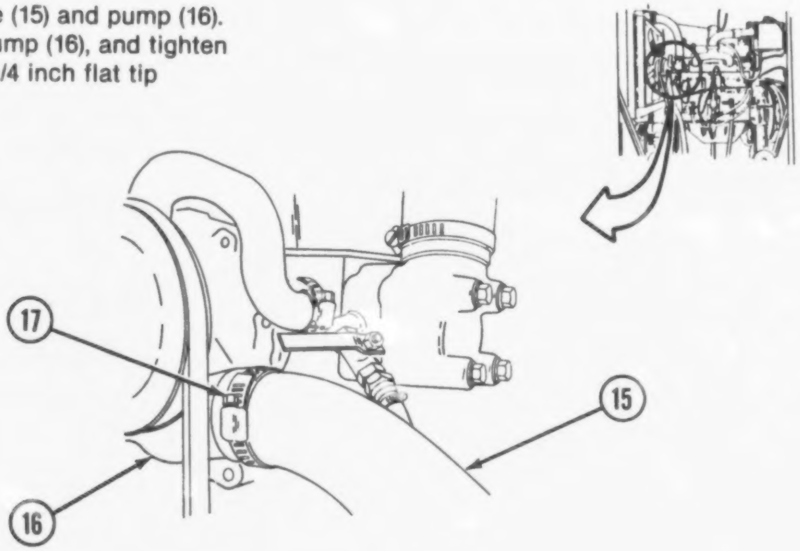
26. CONNECT ENGINE INLET HOSE TO WATER PUMP.
    - Remove rags from hose (15) and pump (16).
    - Connect hose (15) to pump (16), and tighten clamp screw (17). Use 1/4 inch flat tip screwdriver.



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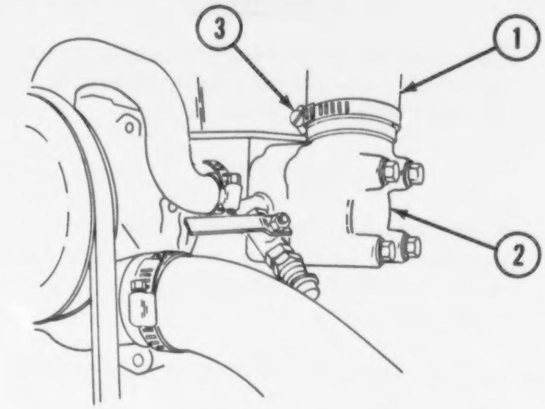
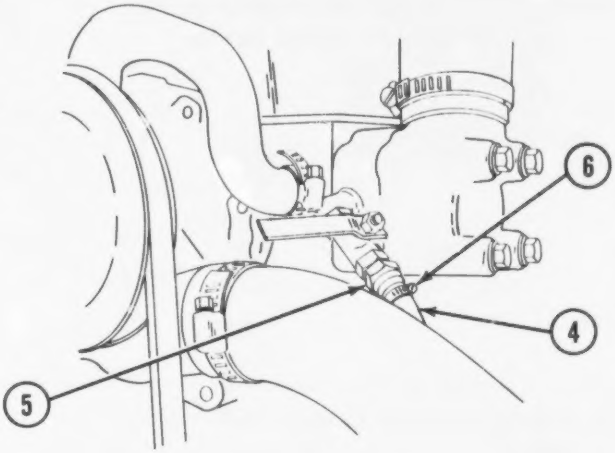
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

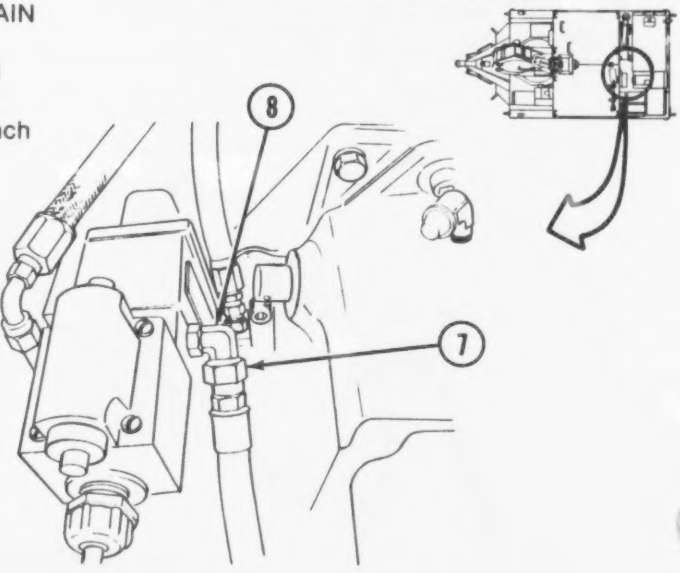
27. CONNECT ENGINE OUTLET HOSE TO COOLANT THERMOSTAT.
    - Remove rags from hose (1) and thermostat (2).
    - Connect hose (1) to thermostat (2), and tighten clamp screw (3). Use 1/4 inch flat tip screwdriver.



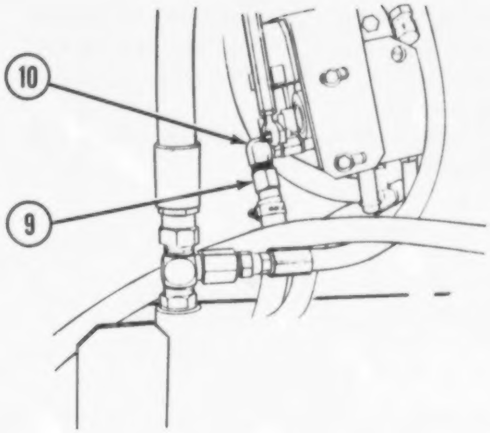
28. CONNECT BATTERY NO. 2 COOLANT SUPPLY HOSE TO ADAPTER.
    - Remove plug and cap from hose (4) and adapter (5).
    - Connect hose (4) to adapter (5), and tighten clamp screw (6). Use 1/4 inch flat tip screwdriver.



29. CONNECT RIGHT SERVO ACTUATOR DRAIN HOSE ASSEMBLY TO SERVO ELBOW.
    - Remove plug and cap from hose (7) and elbow (8).
    - Connect hose (7) to elbow (8). Use 3/4 inch open end wrench.



30. CONNECT RIGHT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW.
    - Remove plug and cap from hose (9) and elbow (10).
    - Connect hose (9) to elbow (10). Use 1 1/4 inch open end wrench.



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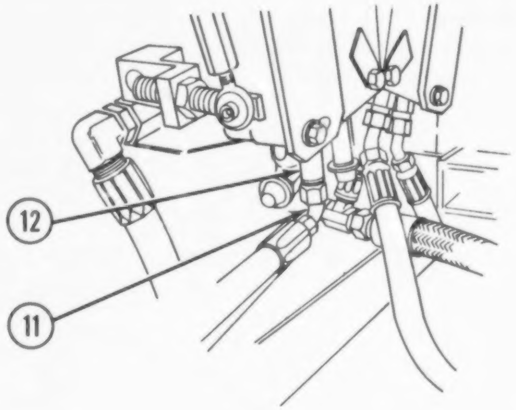
31. CONNECT RIGHT MAGAZINE FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (11) and adapter (12).
    - Connect hose (11) to adapter (12). Use 7/8 inch open end wrench.



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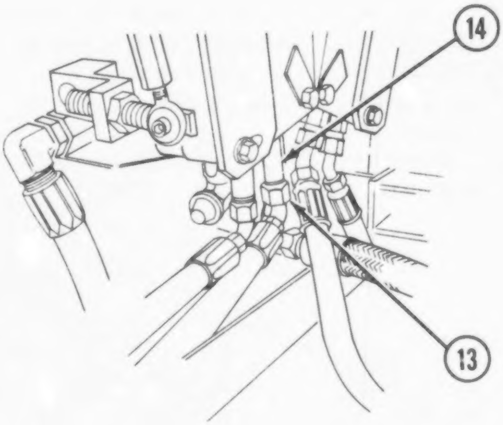
32. CONNECT RIGHT MAGAZINE FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (13) and adapter (14).
    - Connect hose (13) to adapter (14). Use 7/8 inch open end wrench.



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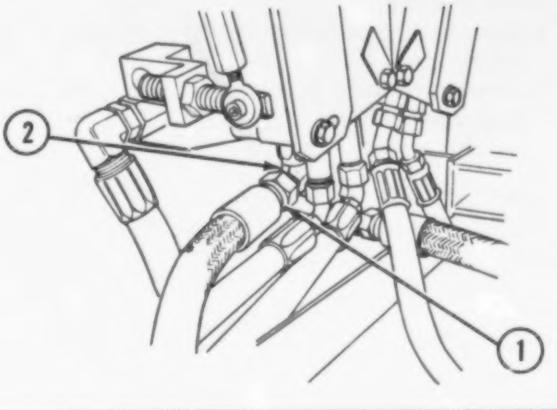
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

33. CONNECT RIGHT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO PUMP TEE REDUCER.
    - Remove plug and cap from hose (1) and reducer (2).
    - Connect hose (1) to reducer (2). Use 1 1/16 inch open end wrench.



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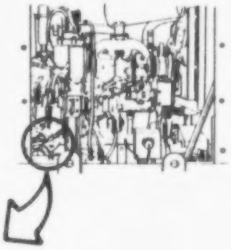
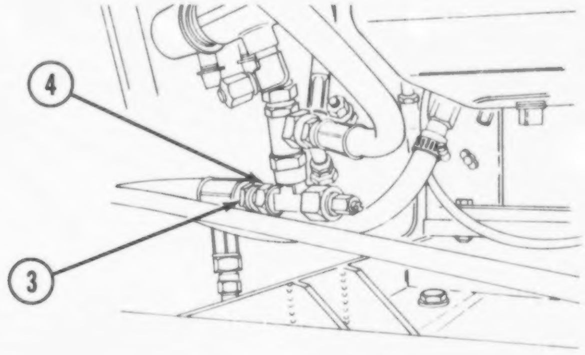
34. CONNECT LEFT MAGAZINE PUMP DRAIN HOSE ASSEMBLY TO PUMP TEE REDUCER.
    - Remove plug and cap from hose (3) and reducer (4).
    - Connect hose (3) to reducer (4). Use 1 1/16 inch open end wrench.





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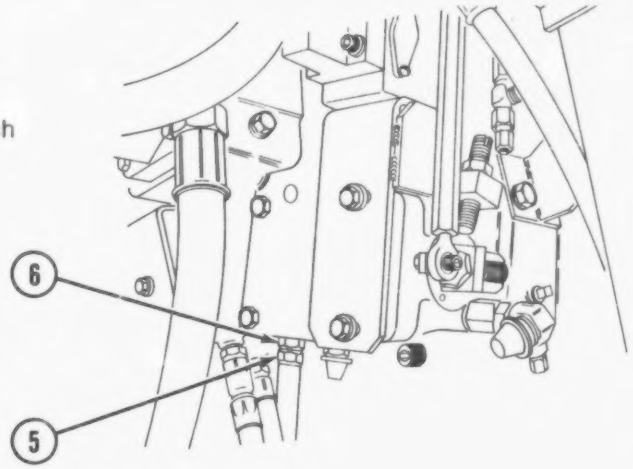
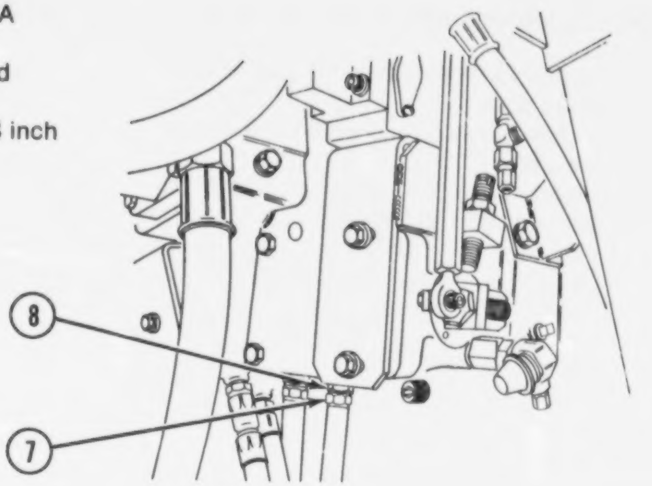
35. CONNECT LEFT MAGAZINE FEED LINE B HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (5) and adapter (6).
    - Connect hose (5) to adapter (6). Use 7/8 inch open end wrench.



36. CONNECT LEFT MAGAZINE FEED LINE A HOSE ASSEMBLY TO PUMP ADAPTER.
    - Remove plug and cap from hose (7) and adapter (8).
    - Connect hose (7) to adapter (8). Use 7/8 inch open end wrench.



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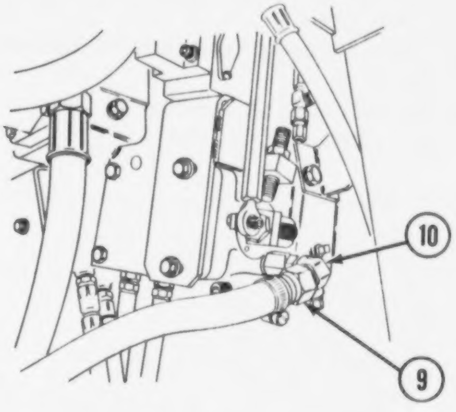
37. CONNECT LEFT MAGAZINE PUMP SUCTION HOSE ASSEMBLY TO SPECIAL PUMP ELBOW.
    - Remove plug and cap from hose (9) and elbow (10).
    - Connect hose (9) to elbow (10). Use 1 1/4 inch open end wrench.



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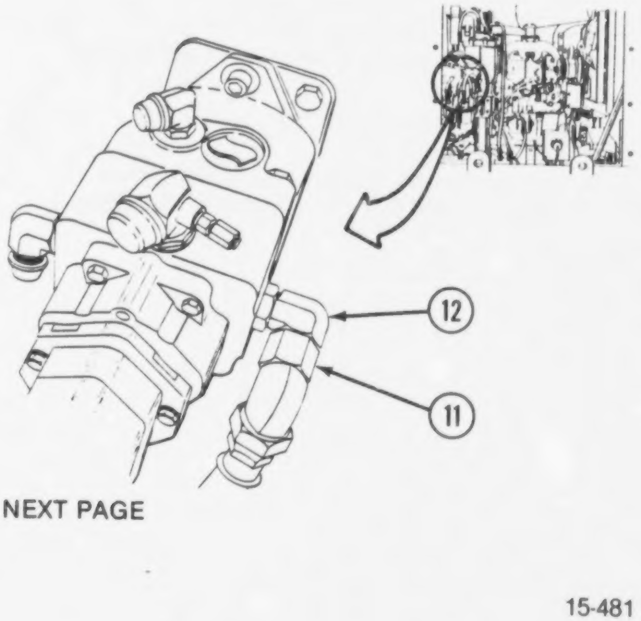
38. CONNECT RETURN HOSE TO LAUNCHER PUMP ELBOW.
    - Remove plug and cap from hose (11) and elbow (12).
    - Connect hose (11) to elbow (12). Use 1 1/2 inch open end wrench.



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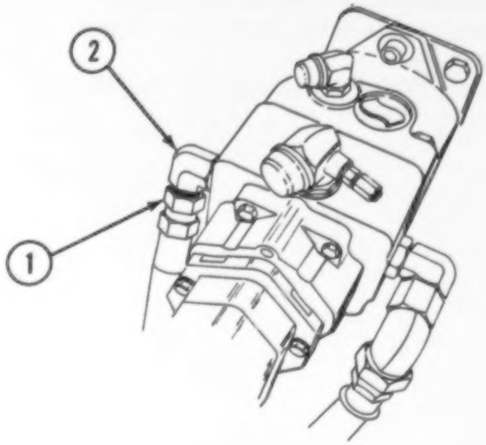
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

39. CONNECT OUTLET HOSE TO LAUNCHER PUMP ELBOW.
    - Remove plug and cap from hose (1) and elbow (2).
    - Connect hose (1) to elbow (2). Use 1 1/2 inch open end wrench.



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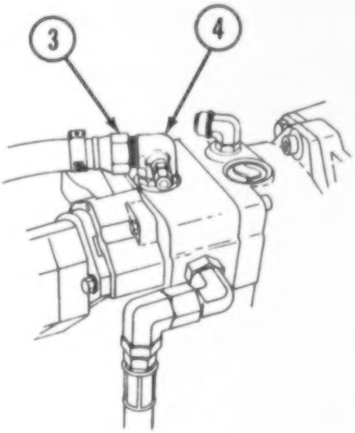
40. CONNECT SUCTION HOSE TO LAUNCHER PUMP ELBOW.
    - Remove plug and cap from hose (3) and elbow (4).
    - Connect hose (3) to elbow (4). Use 1 1/2 inch open end wrench.



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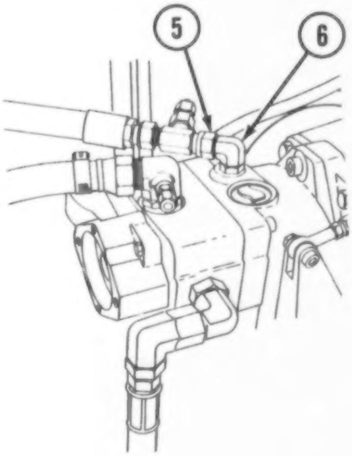
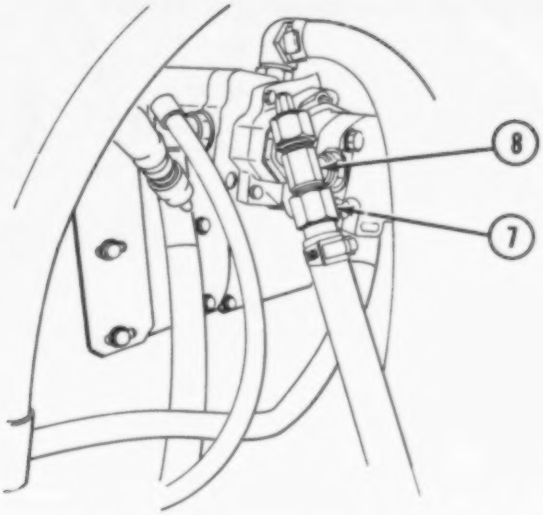
41. CONNECT DRAIN HOSE TEE TO LAUNCHER PUMP ELBOW.
    - Remove plug and cap from tee (5) and elbow (6).
    - Connect tee (5) to elbow (6). Use 1 inch open end and 10 inch adjustable wrenches.



42. CONNECT OSCILLATOR PUMP SUCTION HOSE TO TEE.
    - Remove plug and cap from hose (7) and tee (8).
    - Connect hose (7) to tee (8). Use 1 1/4 inch open end wrench.



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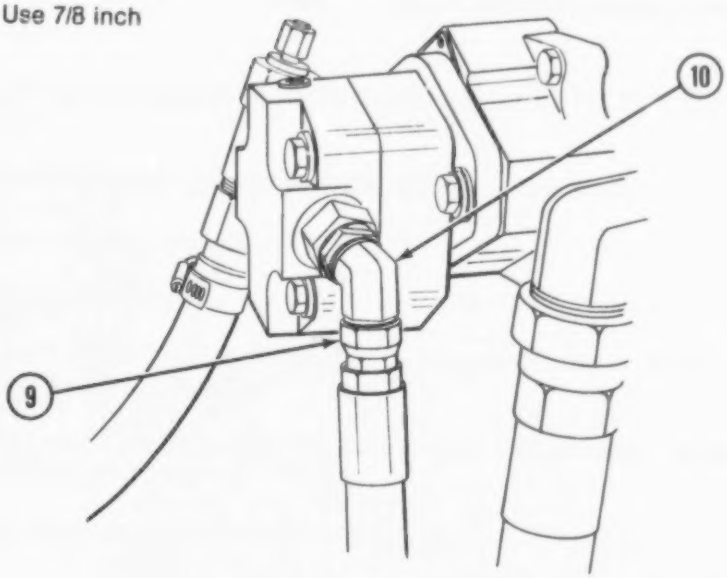
43. CONNECT OSCILLATOR PUMP OUTPUT HOSE TO OUTPUT ELBOW.
    - Remove plug and cap from hose (9) and elbow (10).
    - Connect hose (9) to elbow (10). Use 7/8 inch open end wrench.



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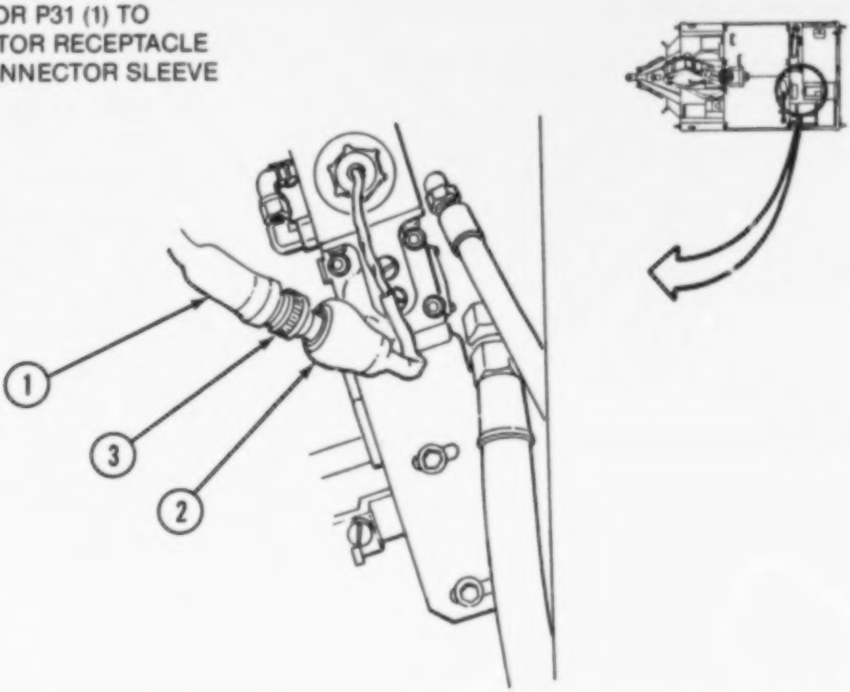
## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

44. CONNECT CONNECTOR P31 (1) TO RIGHT SERVO ACTUATOR RECEPTACLE J31 (2), AND TURN CONNECTOR SLEEVE (3).



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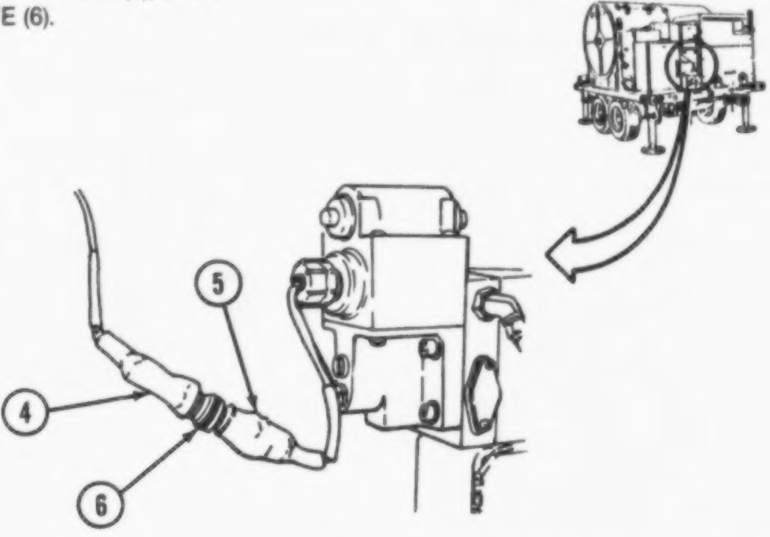
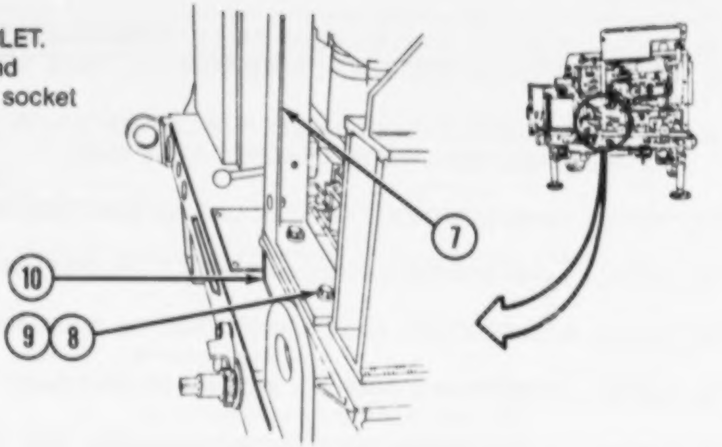
45. CONNECT CONNECTOR P32 (4) TO LEFT SERVO ACTUATOR RECEPTACLE J32 (5), AND TURN CONNECTOR SLEEVE (6).



46. INSTALL RIGHT HAND PALLET TOP SUPPORT ON ENGINE ASSEMBLY PALLET.
    - Install support (7), two washers (8), and screws (9) on pallet (10). Use 3/4 inch socket with ratchet handle.



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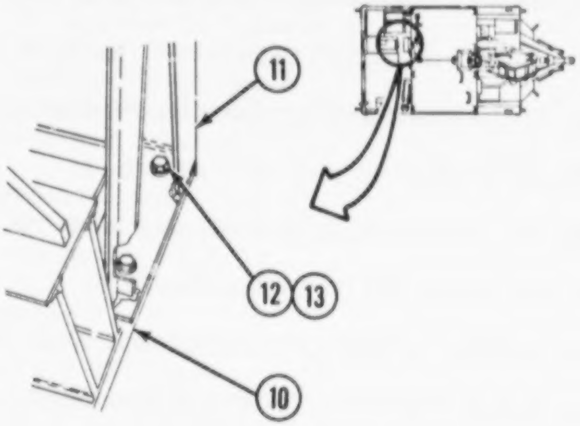
47. INSTALL LEFT HAND PALLET TOP SUPPORT ON ENGINE ASSEMBLY PALLET.
    - Install support (11), two washers (12), and screws (13) on pallet (10). Use 3/4 inch socket with ratchet handle.



48. INSTALL ENGINE GOVERNOR AND FUEL SHUTOFF CONTROL ASSEMBLY LEVER SHIELD ON DISPENSER. (SEE TM 9-1095-205-20.)

49. INSTALL COOLANT HEATER TO ENGINE HOSE ON DISPENSER. (SEE TM 9-1095-205-20.)

50. OPEN COOLANT HEATER SHUTOFF VALVES. (SEE TM 9-1095-205-10.)

51. INSTALL COOLANT HEATER CABLE ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

52. INSTALL LEFT ENGINE PALLET BULKHEAD TEE ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET, PAGE 15-91.)

53. INSTALL LEFT ENGINE PALLET BULKHEAD ELBOW ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET, PAGE 15-91.)

54. INSTALL COOLANT HEATER FUEL INLET HOSE. (SEE TM 9-1095-205-20.)

GO TO NEXT PAGE

## D. DIESEL ENGINE WITH PUMP DRIVE AND PUMPS INSTALLATION — Continued

55. INSTALL SUCTION TO FUEL PUMP PALLET TUBE ASSEMBLY ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET, PAGE 15-91.)

56. INSTALL RETURN TO TANK PALLET TUBE ASSEMBLY ON DISPENSER. (SEE ENGINE FUEL HOSES, FITTINGS, AND FUEL FILTER BRACKET, PAGE 15-91.)

57. INSTALL MAIN CONTROL PANEL MOUNTING BRACKET ON SUPPORTS. (SEE TM 9-1095-205-20.)

58. INSTALL MAIN CONTROL PANEL ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

59. CLOSE MAIN CONTROL PANEL DOOR. (SEE TM 9-1095-205-10.)

60. INSTALL FIXED PANEL SUPPORT. (SEE TM 9-1095-205-20.)

61. INSTALL ENGINE ASSEMBLY TOP ON DISPENSER. (SEE TM 9-1095-205-20.)

62. INSTALL MUFFLER ON DISPENSER. (SEE TM 9-1095-205-20.)

63. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

64. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

65. FILL FUEL TANK. (SEE TM 9-1095-205-10.)

66. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)

67. FILL RADIATOR. (SEE TM 9-1095-205-20.)

68. CONNECT OPERATOR CONTROL BOX TO DISPENSER. (SEE TM 9-1095-205-10.)

69. PLACE OPERATOR CONTROL BOX IN CHECKOUT POSITION. (SEE TM 9-1095-205-10.)

70. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

71. PLACE FUEL SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)

72. PLACE HYDRAULIC SYSTEM IN SERVICE. (SEE TM 9-1095-205-20.)

73. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Install Hinged Panel. (See TM 9-1095-205-20.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-35 ENGINE REMOVAL AND INSTALLATION

**DESCRIPTION**

This task covers:
A. REMOVAL (p 15-488)
B. INSTALLATION (p 15-500)

**INITIAL SETUP**

***Tools and Special Tools:***

- General mechanic's tool kit 5180-00-177-7033:
  - 3/8 inch open end wrench
  - 5/8 inch open end wrench
  - 7/16 inch open end wrench
  - 11/16 inch open end wrench (2)
  - 1/2 inch open end wrench
  - 9/16 inch open end wrench
  - 7/8 inch open end wrench
  - 15/16 inch open end wrench (2)
  - 7/16 inch box end wrench
  - 15/16 inch box end wrench
  - 6 inch adjustable wrench
  - 10 inch adjustable wrench
  - Ratchet handle
  - 3/4 inch socket
  - 5/8 inch socket
  - 15/16 inch socket
  - 10 inch extension
  - 5 inch extension
  - Universal joint
  - Aligning punch
  - Putty knife
  - 1/4 inch flat tip screwdriver
  - 5/16 inch flat tip screwdriver
- Hoist assembly 3950-00-965-0097
- 10 inch pipe wrench 5120-00-277-1483
- Cap and plug set 5340-00-450-5718
- Engine and transmission sling 4910-00-944-4915
- Suitable container

***Materials/Parts:***

- Self-locking nut (4) 5310-00-269-4040
- Lock washer (5) 5310-00-209-0965
- Lock washer (8) 5310-00-003-4094
- Sealing compound, Item 25, Appendix B
- Self-locking nut 5120-00-088-1251
- Solvent, Item 28, Appendix B
- Rags, Item 22, Appendix B
- Gasket 5330-00-012-3062
- Lubricating oil (see LO 9-1095-205-12), Item 16, Appendix B

***Personnel Required:***

- Mechanic
- Helper

***References:***

- LO 9-1095-205-12
- TM 9-1095-205-10
- TM 9-1095-205-20
- FUEL INJECTION PUMP, Page 15-161
- LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, Page 15-275
- LAUNCHER PUMP LINKAGE ADJUSTMENT, Page 15-303
- LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, Page 15-307
- MAGAZINE PUMPS LINKAGE ADJUSTMENT, Page 15-401
- PUMP DRIVE INSTALLATION, Page 15-263
- RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, Page 15-351
- SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, Page 15-409
- SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, Page 15-15

GO TO NEXT PAGE

## 15-35 ENGINE REMOVAL AND INSTALLATION — Continued

### OVERVIEW

Fuel, oil, and coolant hose assemblies and tube assemblies have fluid in them. Loosen hose assembly and tube assembly couplings slowly. Catch fluid with rags or in suitable containers. Wipe up spilled fluid. Dispose of drained fluid according to local procedures.

If you remove or disconnect more than one hose assembly or tube assembly, tag and mark each one. Remove tags after installing or connecting hose assemblies or tube assemblies.

Seal fluid line fittings. Nonflared fittings, or fittings without seal, gasket, preformed packing, or other sealing hardware need sealant. Clean fittings, and apply sealing compound to all male threads except three starting threads.

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### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***

Remove Operator Control Box From Storage Cabinet. (See TM 9-1095-205-10.)
Remove Cables From Storage Cabinet. (See TM 9-1095-205-10.)
Unstow Operator's Manual. (See TM 9-1095-205-10.)
Unstow Rawhide Mallet. (See TM 9-1095-205-10.)
Unstow Manual Crank. (See TM 9-1095-205-10.)
Remove Control Box Storage Assembly. (See TM 9-1095-205-20.)
Remove Hinged Panel. (See TM 9-1095-205-20.)
Remove Muffler. (See TM 9-1095-205-20.)
Remove Fixed Panel. (See TM 9-1095-205-20.)
Remove Front Panel. (See TM 9-1095-205-20.)
Remove Engine Assembly Top. (See TM 9-1095-205-20.)
Remove Fixed Panel Support. (See TM 9-1095-205-20.)
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Main Control Panel Door. (See TM 9-1095-205-20.)
Remove Main Control Panel Assembly. (See TM 9-1095-205-20.)
Remove Main Control Panel Mounting Bracket. (See TM 9-1095-205-20.)
Drain Radiator. (See TM 9-1095-205-20.)
Drain Engine Oil. (See LO 9-1095-205-12.)
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Drain Hydraulic Reservoir. (See TM 9-1095-205-20.)
Drain Fuel Tank. (See TM 9-1095-205-20.)
Remove Servo Actuator Hydraulic Line Filter Assemblies And Filter Bracket. (See Servo Actuator Hydraulic Line Filter Assemblies and Filter Bracket, Page 15-409.)
Remove Engine Electrical Assembly. (See TM 9-1095-205-20.)
Remove Thermostat Housing. (See TM 9-1095-205-20.)
Remove Speed Control Transmitter And Shaft Assembly. (See Speed Control Transmitter and Shaft Assembly, Page 15-15.)
Remove Left Servo Actuator. (See Left Magazine Pump Assembly and Servo Actuator, Page 15-307.)

Remove Oscillator Pump. (See Launcher and Oscillator Pumps Installation, Page 15-275.)
Remove Launcher Pump. (See Launcher and Oscillator Pumps Installation, Page 15-275.)
Remove Right Servo Actuator. (See Right Magazine Pump Assembly and Servo Actuator, Page 15-351.)
Remove Right Magazine Pump. (See Right Magazine Pump Assembly and Servo Actuator, Page 15-351.)
Remove Hydraulic Pump Drive With Drive Shaft. (See Pump Drive Installation, Page 15-263.)
Remove Engine Control Bracket Assembly. (See TM 9-1095-205-20.)

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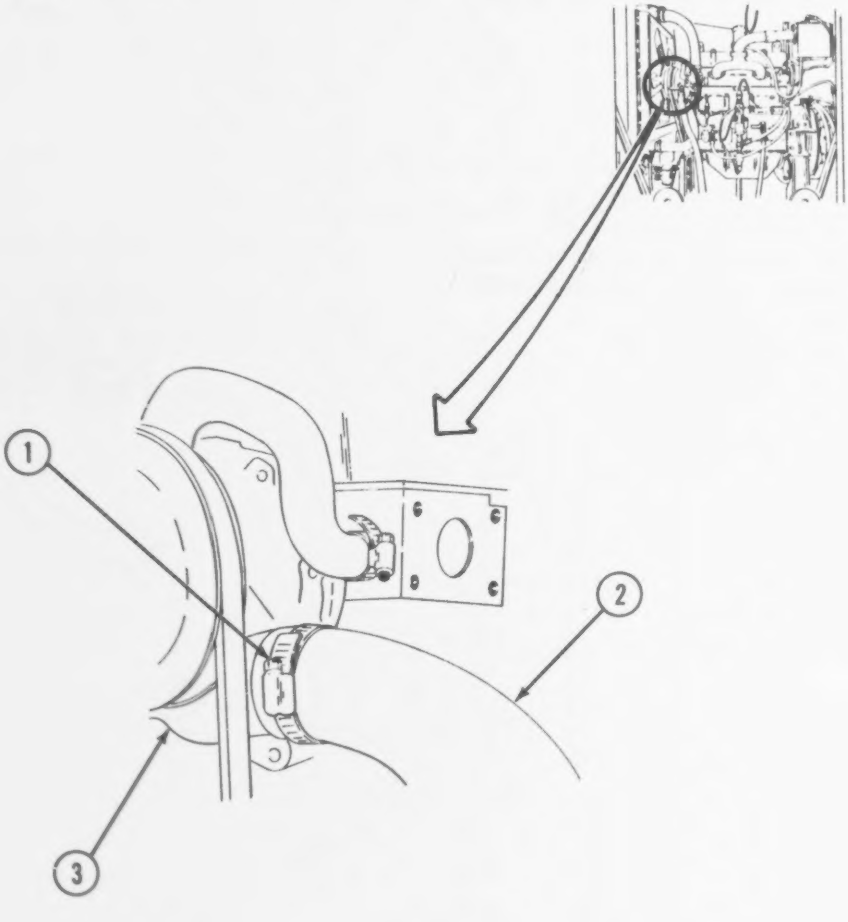
1. DISCONNECT ENGINE INLET HOSE FROM WATER PUMP.
   - Loosen clamp screw (1), and disconnect hose (2) from pump (3). Use 1/4 inch flat tip screwdriver.
   - Plug hose and pump. Use rags.



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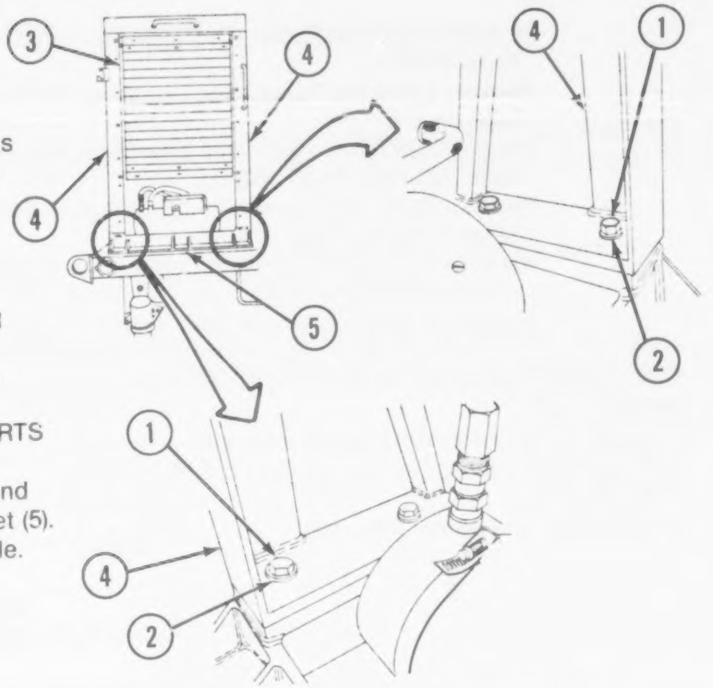
## A. REMOVAL — Continued

**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

**CAUTION**

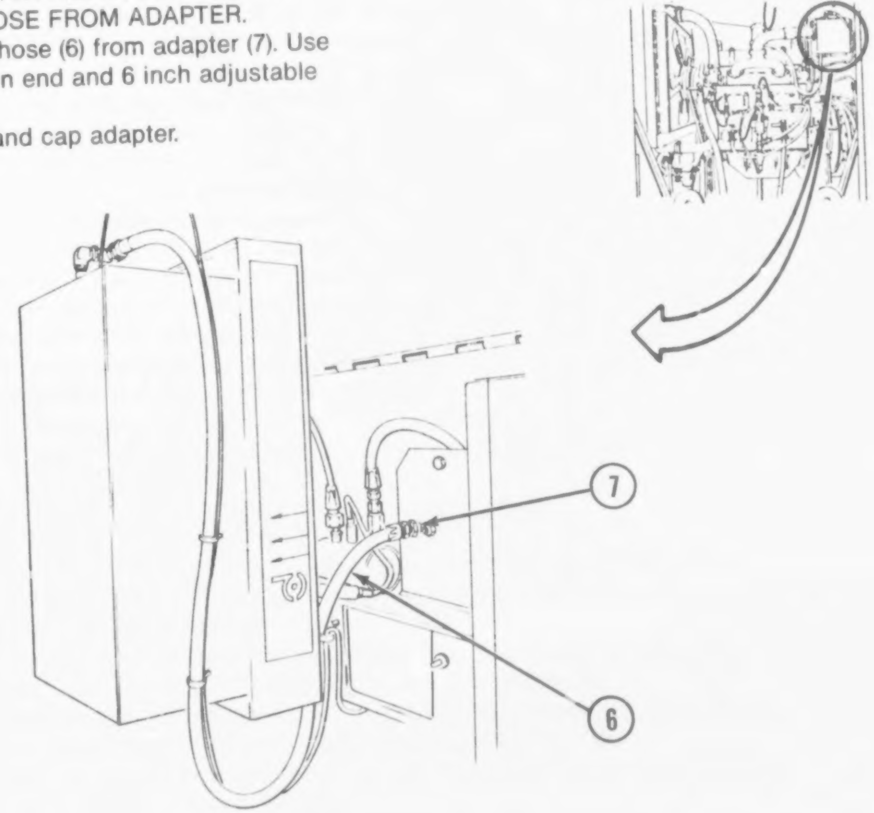
Radiator can fall and be damaged during removal. Use helper when removing mounting screws from radiator supports.



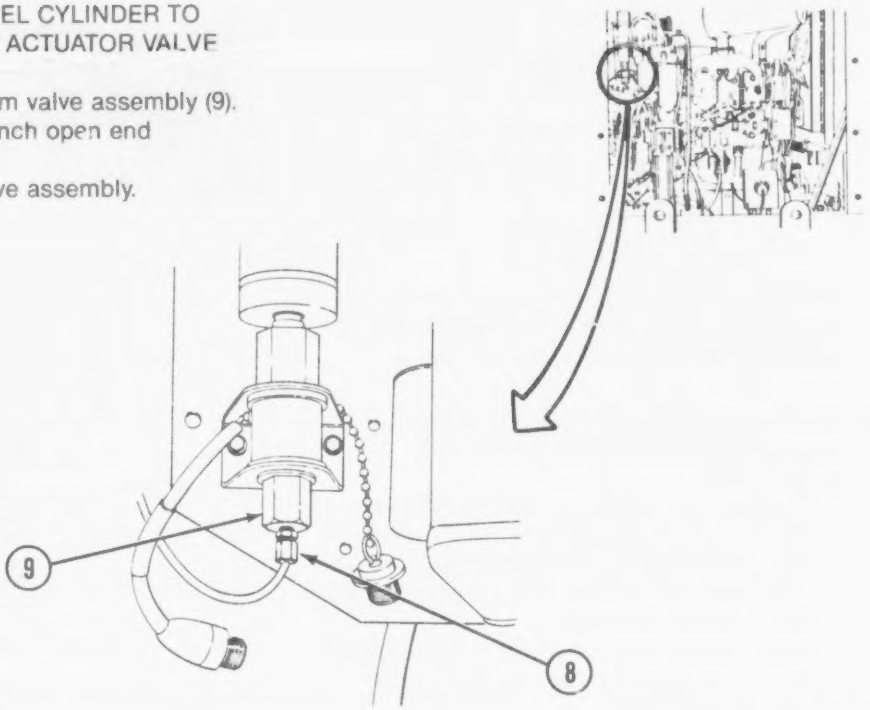
2. REMOVE RADIATOR WITH TWO SUPPORTS FROM ENGINE ASSEMBLY PALLET.
   - Remove four screws (1), washers (2), and radiator (3) with supports (4) from pallet (5). Use 3/4 inch socket with ratchet handle. Use helper.

---

3. DISCONNECT AIR FILTER SERVICE AIR INDICATOR HOSE FROM ADAPTER.
   - Disconnect hose (6) from adapter (7). Use 1/2 inch open end and 6 inch adjustable wrenches.
   - Plug hose, and cap adapter.



4. DISCONNECT ETHER FUEL CYLINDER TO AIR INTAKE TUBE FROM ACTUATOR VALVE ASSEMBLY.
   - Disconnect tube (8) from valve assembly (9). Use 7/16 inch and 3/8 inch open end wrenches.
   - Plug tube, and cap valve assembly.



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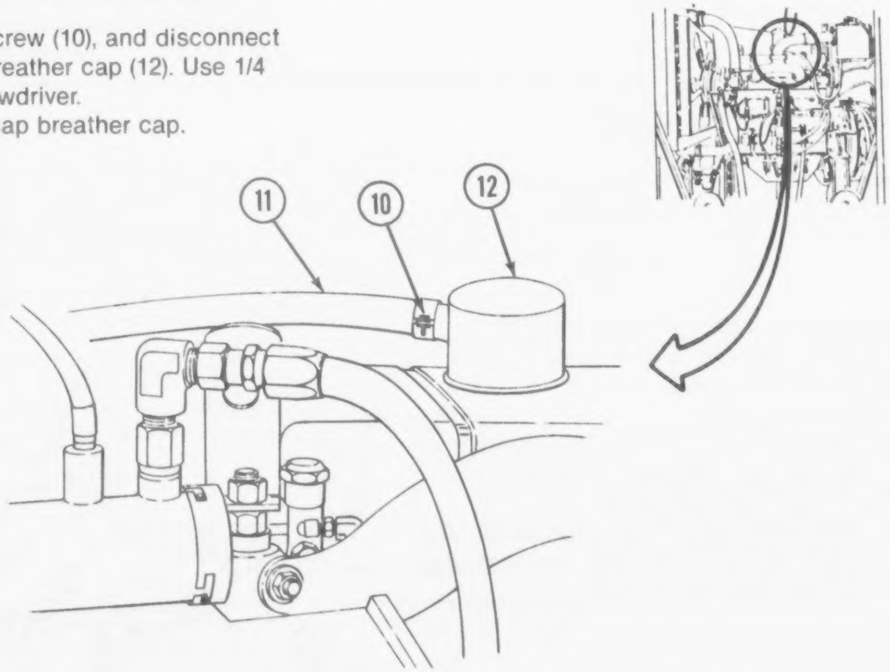
5. DISCONNECT BREATHER HOSE FROM BREATHER CAP.
   - Loosen clamp screw (10), and disconnect hose (11) from breather cap (12). Use 1/4 inch flat tip screwdriver.
   - Plug hose, and cap breather cap.



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**A. REMOVAL — Continued**

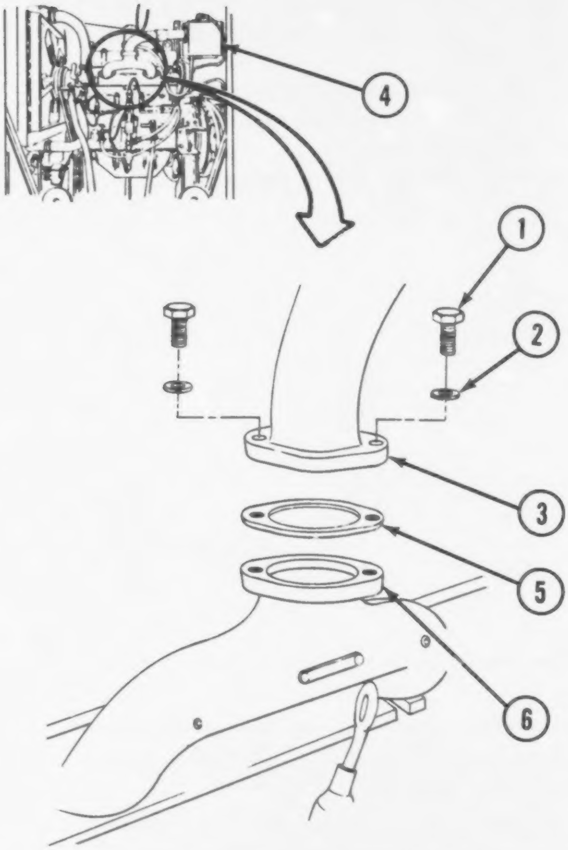
**WARNING**

Cleaning solvent can explode and can burn. Read warning on front page of this manual.

**CAUTION**

Air cleaner assembly can fall and be damaged during removal. Use helper when removing screws from intake manifold.

6. REMOVE AIR INTAKE PIPE WITH AIR CLEANER ASSEMBLY FROM INTAKE MANIFOLD.
   - Remove two screws (1), lock washers (2), air intake pipe (3) with air cleaner (4), and gasket (5) from intake manifold (6). Use 5/8 inch open end wrench. Use helper. Discard lock washers and gasket.
   - Clean mating surfaces of air intake pipe (3) and intake manifold (6). Use putty knife, solvent, and rags.
   - Plug air intake pipe and intake manifold. Use rags.



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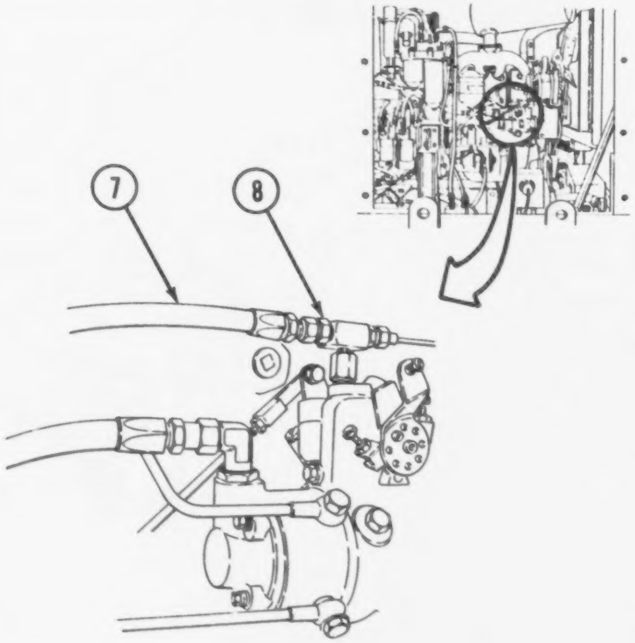
**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

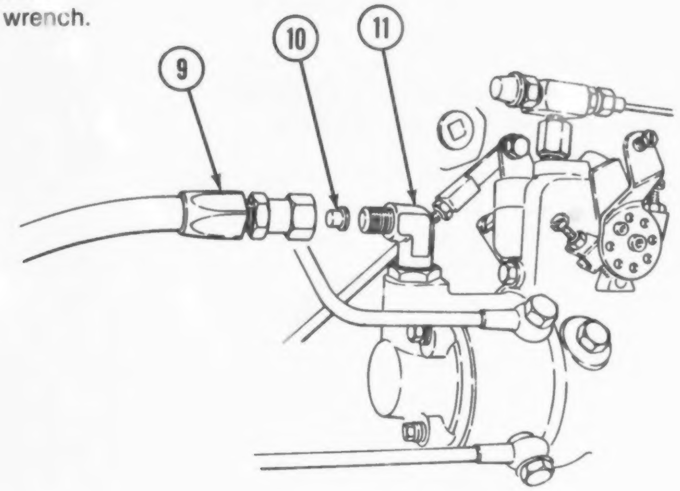
• • • •

Fuel can catch fire and burn you. NO SMOKING. Remove battery ground cable before working on fuel system.

7. DISCONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY FROM FUEL INJECTION PUMP ADAPTER.
   - Disconnect hose (7) from adapter (8). Use 1/2 inch and 9/16 inch open end wrenches.
   - Plug hose, and cap adapter.



8. DISCONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY FROM FUEL INJECTION PUMP ELBOW.
   - Disconnect hose (9) with eyelet (10) from elbow (11). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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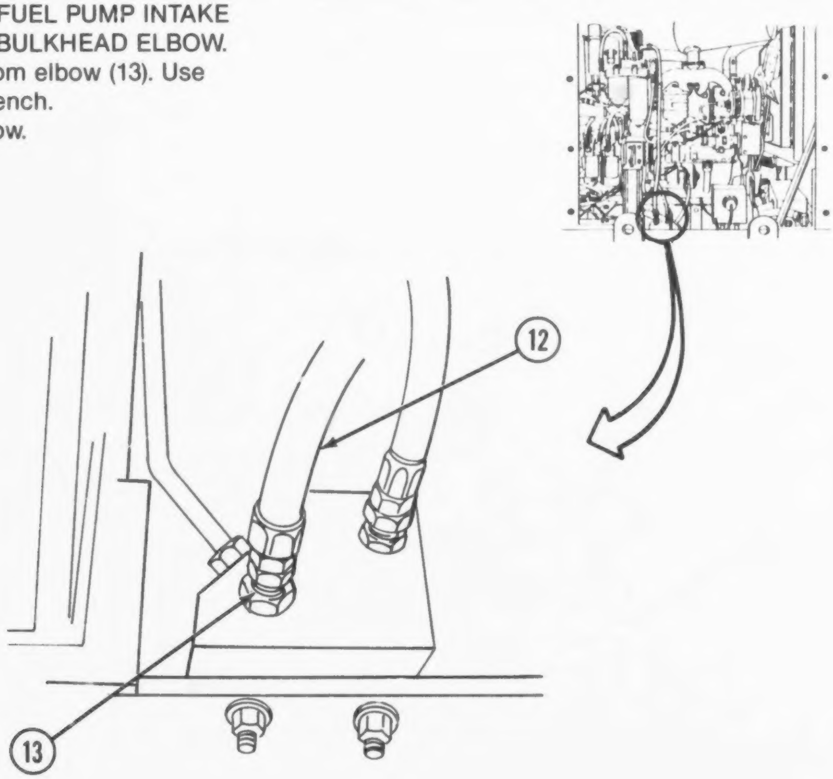
9. DISCONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY FROM BULKHEAD ELBOW.
   - Disconnect hose (12) from elbow (13). Use 11/16 inch open end wrench.
   - Plug hose, and cap elbow.



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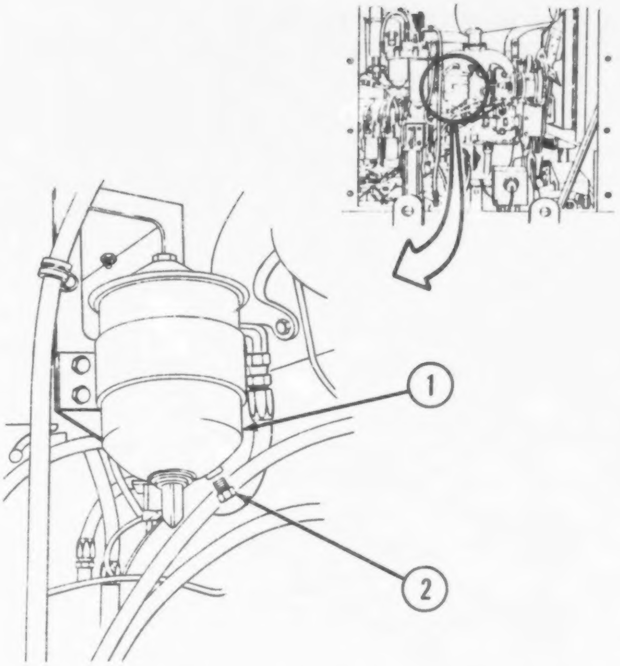
## A. REMOVAL — Continued



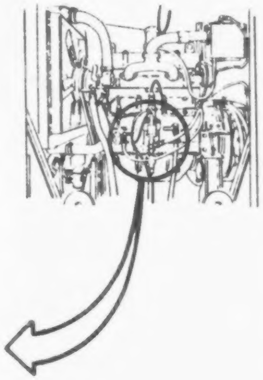
### NOTE

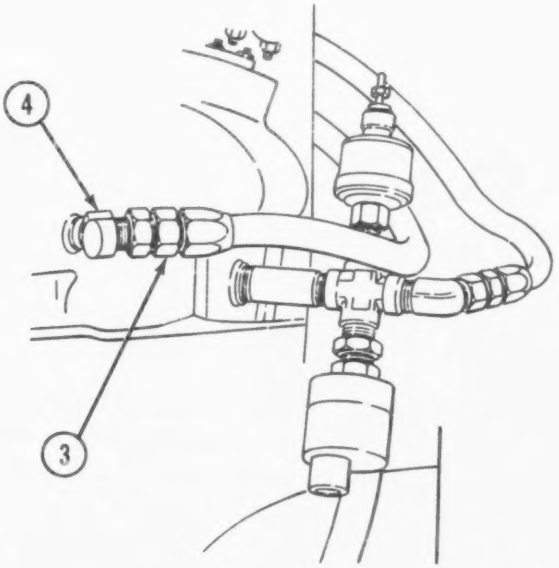
Suitable container must hold at least 2 qt (1.9 L).

10. DRAIN OIL FROM OIL FILTER ASSEMBLY.
    - Place suitable container under filter assembly (1).
    - Remove drain plug (2) from filter assembly (1). Use 6 inch adjustable wrench.
    - Drain oil from filter assembly (1).
    - Plug filter assembly.

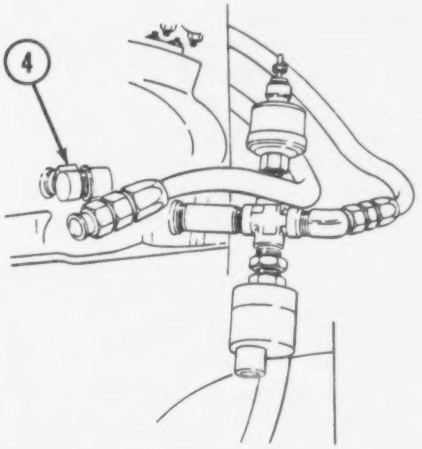
---

11. DISCONNECT OIL RETURN HOSE ASSEMBLY FROM 45° ELBOW.
    - Disconnect hose (3) from elbow (4). Use 7/8 inch open end and 10 inch adjustable wrenches.
    - Plug hose, and cap elbow.





12. REMOVE 45° ELBOW FROM ENGINE.
    - Remove elbow (4) from engine. Use 10 inch adjustable wrench.
    - Plug engine, and cap elbow.



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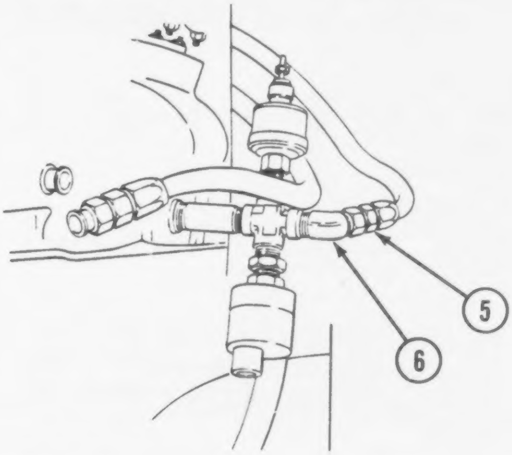
13. DISCONNECT OIL PRESSURE HOSE ASSEMBLY FROM CROSSPIPE ELBOW.
    - Disconnect hose (5) from elbow (6). Use 7/8 inch open end and 10 inch adjustable wrenches.
    - Plug hose, and cap elbow.



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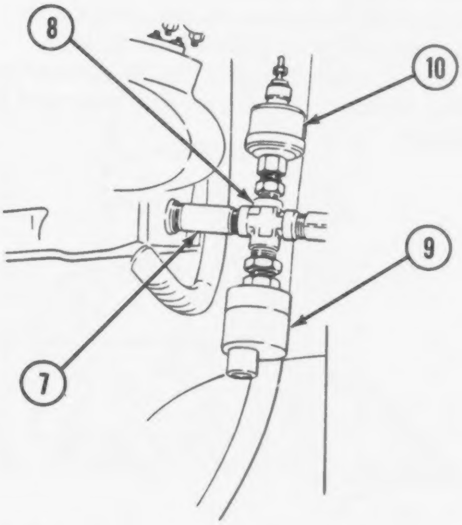
14. REMOVE NIPPLE WITH CROSSPIPE, OIL PRESSURE SWITCH, AND OIL PRESSURE TRANSMITTER FROM ENGINE.
    - Remove nipple (7) with crosspipe (8), switch (9), and transmitter (10) from engine. Use 10 inch pipe wrench.
    - Plug engine, and cap nipple.



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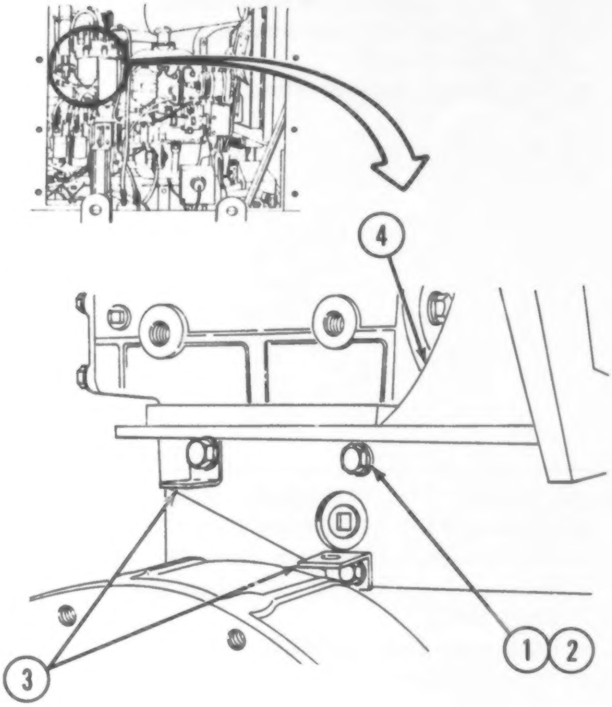
## A. REMOVAL — Continued

**CAUTION**

Fuel filter bracket with attached assemblies can fall and be damaged during removal. Use helper when removing mounting screws from fuel filter bracket.

15. REMOVE FUEL FILTER BRACKET WITH COLD START, ELECTRIC FUEL PUMP, FUEL FILTER, FUEL STRAINER, AND OIL FILTER ASSEMBLIES FROM ENGINE.
    - Remove three screws (1), lock washers (2), two harness brackets (3), and fuel filter bracket (4) from engine. Use 5/8 inch socket with 5 inch extension and ratchet handle. Use helper. Discard lock washers.



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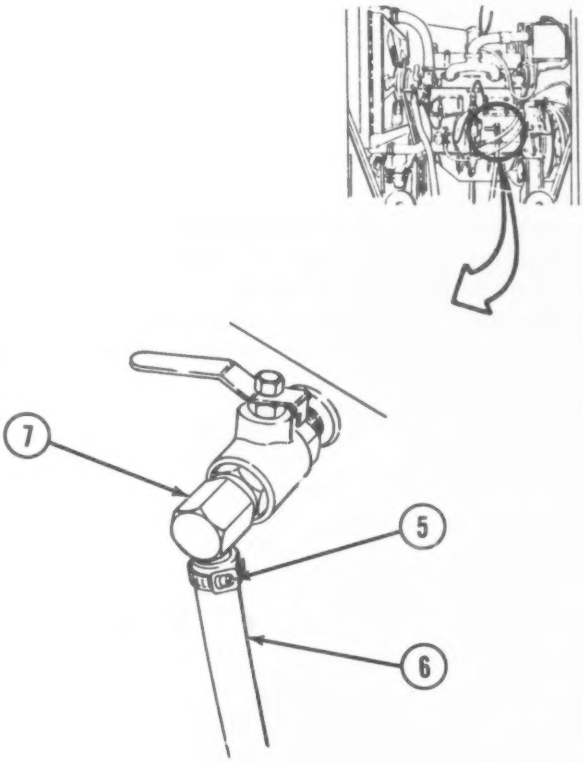
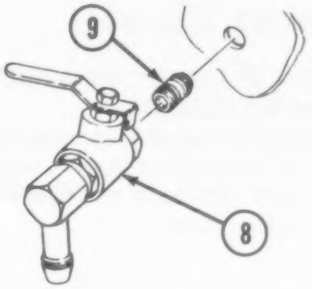
**NOTE**

Close nipple may remain in engine when ball valve is removed from engine. In this event, close nipple must be removed from engine.

16. REMOVE ENGINE INLET BALL VALVE WITH CLOSE NIPPLE FROM ENGINE.
    - Loosen clamp screw (5), and disconnect coolant heater to engine hose (6) from elbow (7). Use 5/16 inch flat tip screwdriver.
    - Plug coolant heater to engine hose, and cap elbow.



- Remove valve (8) with close nipple (9) from engine. Use 10 inch adjustable wrench.
- If close nipple (9) remains in engine, remove close nipple from engine. Use 10 inch pipe wrench.
- Plug engine, and cap close nipple.



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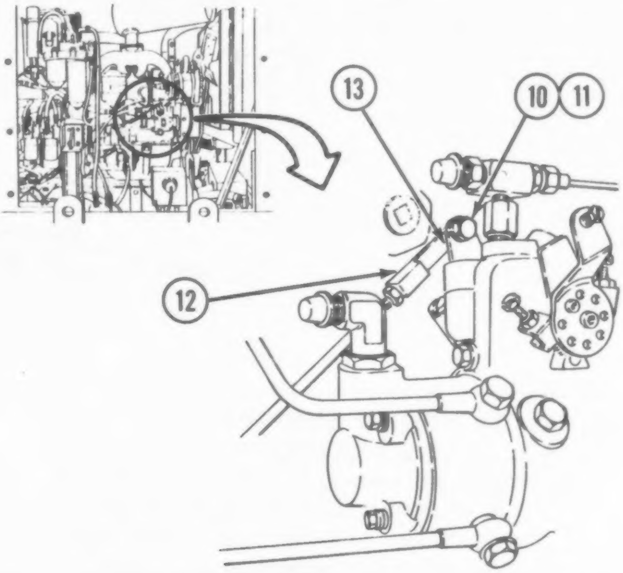
17. REMOVE THROTTLE CABLE CLEVIS FROM FUEL INJECTION PUMP THROTTLE ARM.
    - Remove self-locking nut (10), screw (11), and clevis (12) from arm (13). Use 7/16 inch box end and 7/16 inch open end wrenches. Discard self-locking nut.



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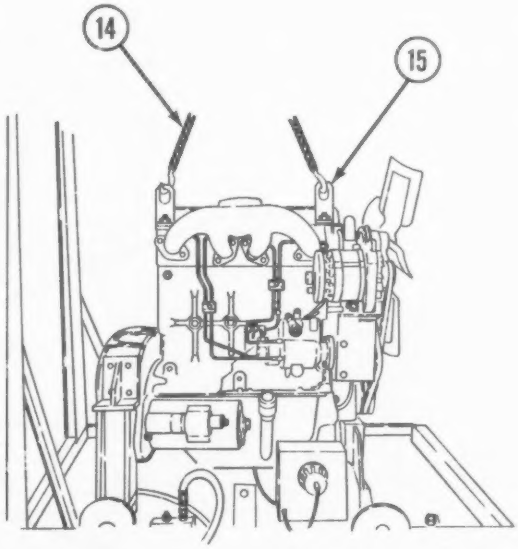
18. ATTACH ENGINE AND TRANSMISSION SLING TO ENGINE.
    - Attach sling (14) to two lifting eyes (15).
    - Take up slack in sling (14). Use hoist.



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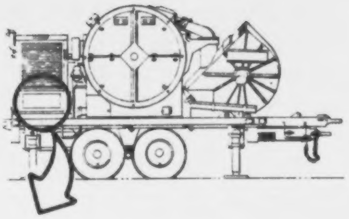
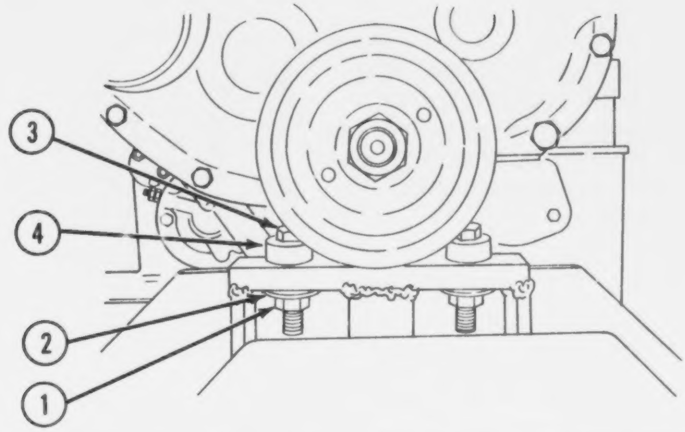
**A. REMOVAL — Continued**

19. REMOVE TWO SCREWS FROM FRONT ENGINE SUPPORT.
    - Remove two self-locking nuts (1), washers (2), and screws (3) from support (4). Use two 15/16 inch open end wrenches. Discard self-locking nuts.





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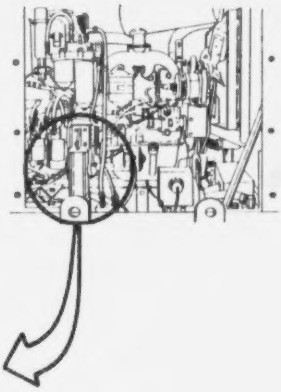
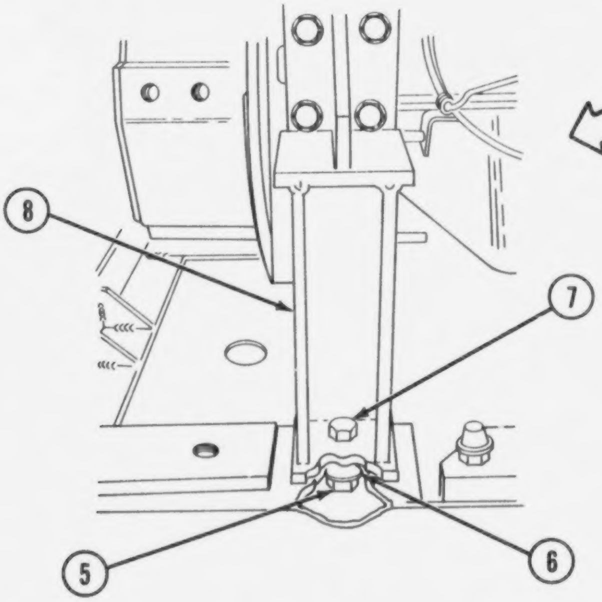
20. REMOVE RIGHT SIDE SUPPORT SCREW FROM ENGINE ASSEMBLY PALLET.
    - Remove self-locking nut (5), washer (6), and screw (7) from right side support (8). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle. Discard self-locking nut.





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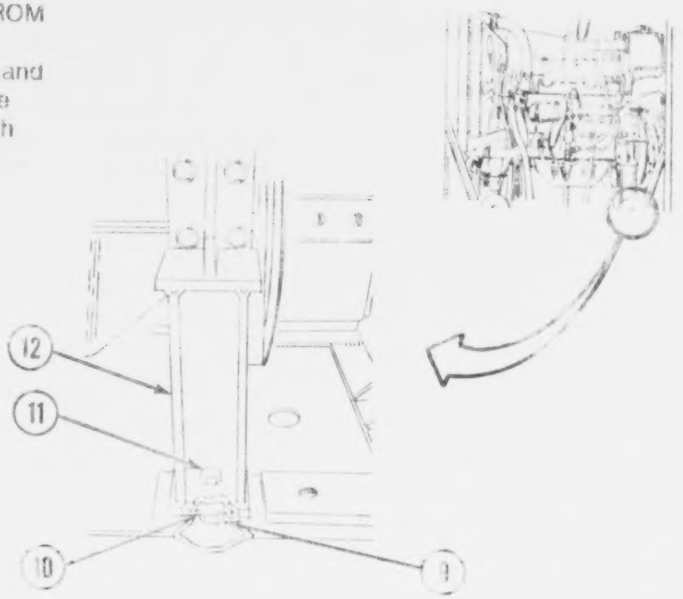
21. REMOVE LEFT SIDE SUPPORT SCREW FROM ENGINE ASSEMBLY PALLET.
    - Remove self-locking nut (9), washer (10), and screw (11) from left side support (12). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle. Discard self-locking nut.



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**WARNING**

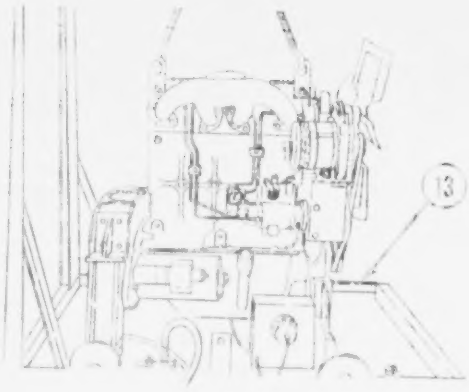
Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment when power unit is being removed or installed.

**CAUTION**

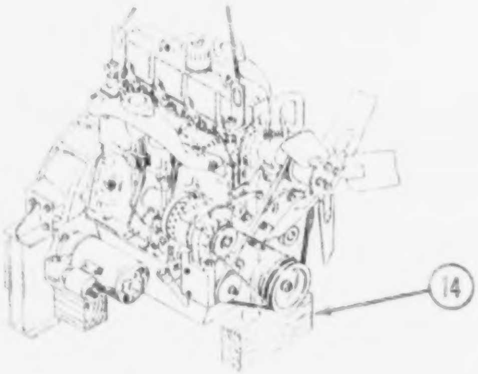
Engine, mechanical, electrical, oil, hydraulic, fuel, and coolant connections can be damaged during engine removal. Make sure all connections are disconnected before hoisting engine.

• • • •

Prevent equipment damage. Have helper guide engine when engine is removed from dispenser.



22. REMOVE ENGINE FROM ENGINE ASSEMBLY PALLET.
    - Have helper guide engine. Remove engine from pallet (13), and place engine on wood block supports (14) on floor. Use hoist with engine and transmission sling.



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## A. REMOVAL — Continued

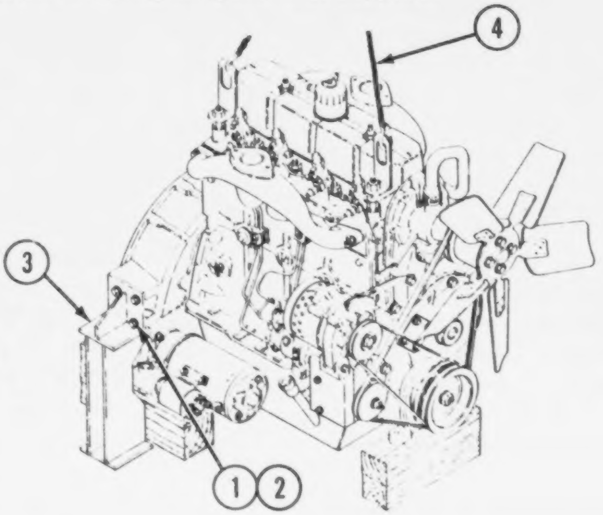
**CAUTION**

Engine can fall and be damaged during removal of sling and side supports. Support engine with wood blocks before removing sling and side supports from engine.

**NOTE**

Right and left side supports are removed the same way. Step 23 shows right side support.

23. REMOVE RIGHT AND LEFT SIDE SUPPORTS FROM ENGINE.
    - Remove four screws (1), lock washers (2), and right side support (3) from engine. Use 3/4 inch socket with ratchet handle. Discard lock washers.
    - Repeat above removal step for left side support.
    - Remove engine and transmission sling (4) from engine.



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## B. INSTALLATION

**NOTE**

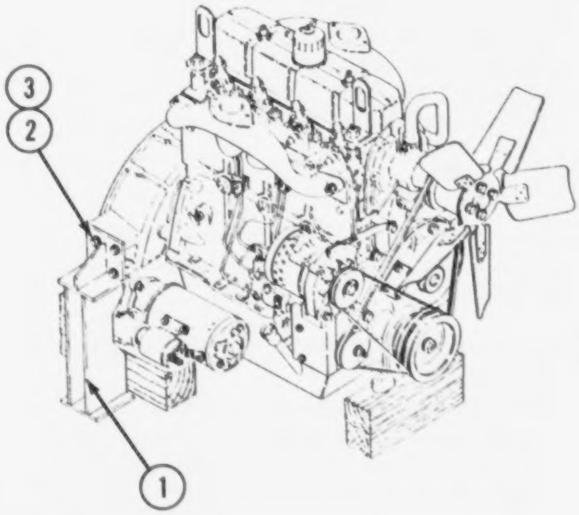
***PRELIMINARY PROCEDURES:***

Remove Four Splined Self-Locking Nuts. (See Engine Assembly Top And Supports, TM 9-1095-205-20.)
Repair Engine Assembly Pallet. (See Engine Assembly Top and Supports, TM 9-1095-205-20.)
Install Four New Splined Self-Locking Nuts. (See Engine Assembly Top and Supports, TM 9-1095-205-20.)

**NOTE**

Right and left side supports are installed the same way. Step 1 shows right side support.

1. INSTALL RIGHT AND LEFT SIDE SUPPORTS ON ENGINE.
   - Install right side support (1), four new lock washers (2), and screws (3) on engine. Use 3/4 inch socket with ratchet handle.
   - Repeat above installation step for left side support.

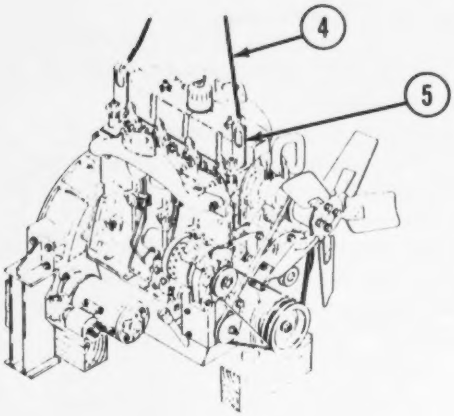


**WARNING**

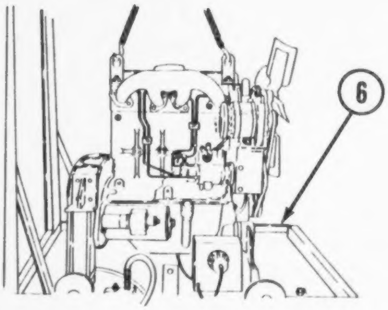
Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment when power unit is being removed or installed.

**CAUTION**

Prevent equipment damage. Use helper when positioning engine on engine assembly pallet.



2. POSITION ENGINE ON ENGINE ASSEMBLY PALLET.
   - Attach engine and transmission sling (4) to two lifting eyes (5).
   - Take up slack in engine and transmission sling (4). Use hoist.
   - Position engine on pallet (6), with mounting holes alined. Use hoist with engine and transmission sling. Use helper.



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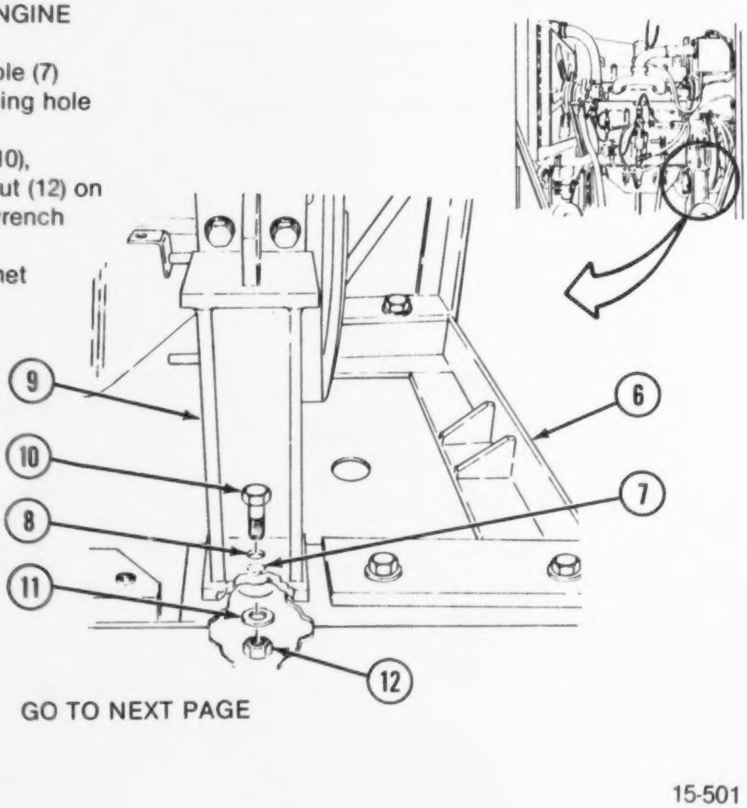
3. INSTALL LEFT SIDE SUPPORT ON ENGINE ASSEMBLY PALLET.
   - Aline left side support mounting hole (7) with engine assembly pallet mounting hole (8). Use aligning punch.
   - Install left side support (9), screw (10), washer (11), and new self-locking nut (12) on pallet (6). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle. Do not tighten.



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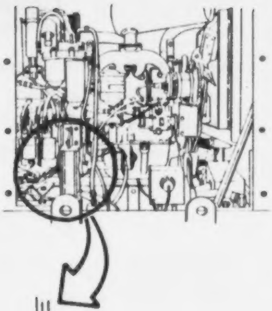
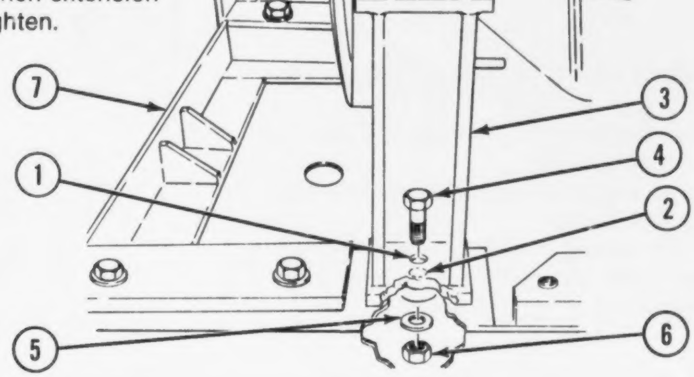
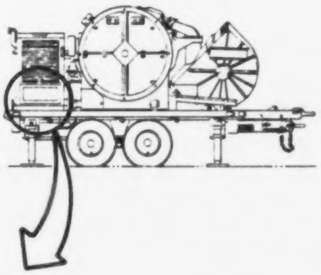
**B. INSTALLATION — Continued**

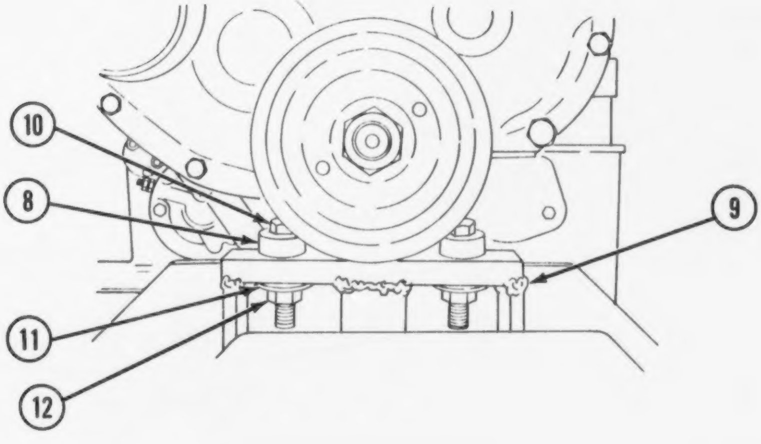
4. INSTALL RIGHT SIDE SUPPORT ON ENGINE ASSEMBLY PALLET.
   - Aline right side support mounting hole (1) with engine assembly pallet mounting hole (2). Use aligning punch.
   - Install right side support (3), screw (4), washer (5), and new self-locking nut (6) on pallet (7). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle. Do not tighten.



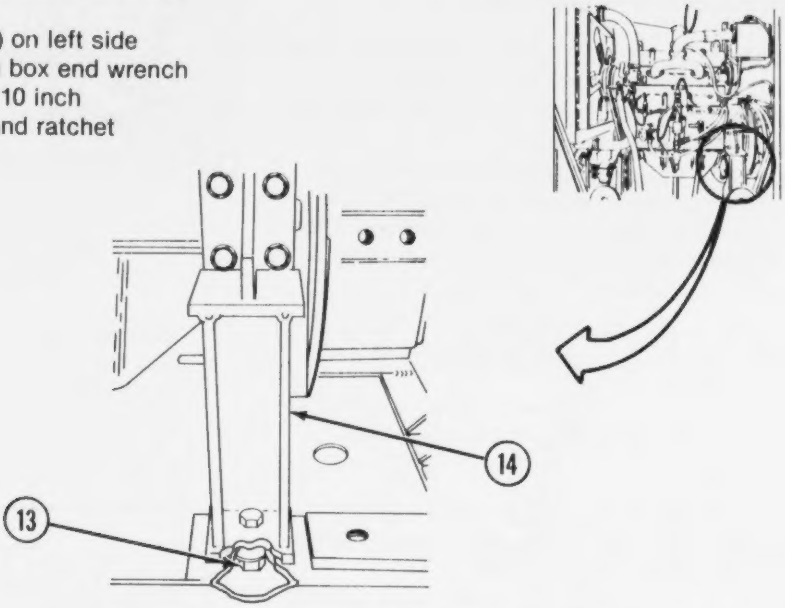


5. INSTALL FRONT ENGINE SUPPORT ON ENGINE MOUNT.
   - Position support (8) on engine mount (9) with mounting holes alined. Use aligning punch.
   - Install support (8), two screws (10), washers (11), and new self-locking nuts (12) on engine mount (9). Use two 15/16 inch open end wrenches.





6. TIGHTEN SELF-LOCKING NUT ON LEFT SIDE SUPPORT.
   - Tighten self-locking nut (13) on left side support (14). Use 15/16 inch box end wrench and 15/16 inch socket with 10 inch extension, universal joint, and ratchet handle.



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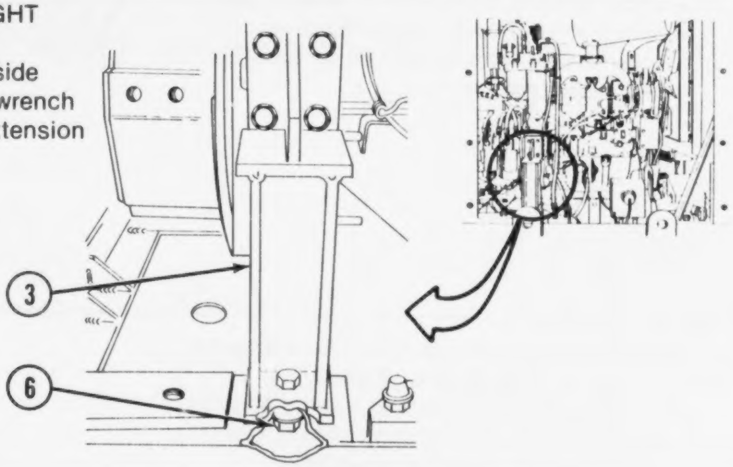
7. TIGHTEN SELF-LOCKING NUT ON RIGHT SIDE SUPPORT.
   - Tighten self-locking nut (6) on right side support (3). Use 15/16 inch box end wrench and 15/16 inch socket with 5 inch extension and ratchet handle.



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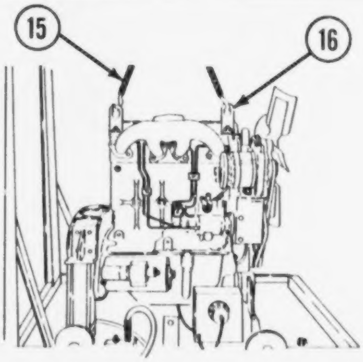
8. REMOVE ENGINE AND TRANSMISSION SLING FROM ENGINE.
   - Release tension in sling (15). Use hoist.
   - Remove sling (15) from two lifting eyes (16).



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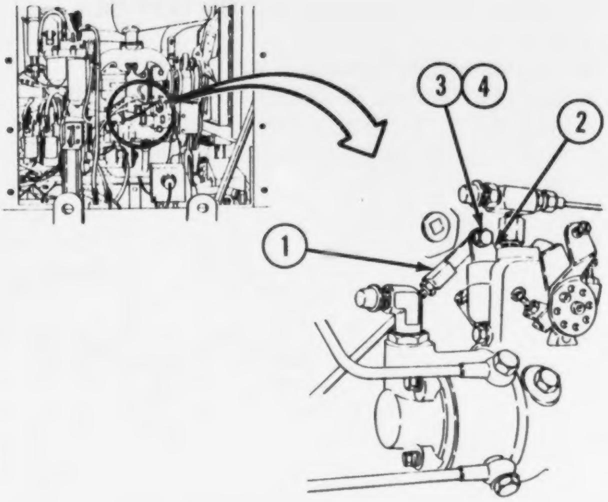
## B. INSTALLATION — Continued

9. INSTALL THROTTLE CABLE CLEVIS TO FUEL INJECTION PUMP THROTTLE ARM.
   - Position clevis (1) on arm (2) with long side of clevis toward engine.
   - Install screw (3), clevis (1), and new self-locking nut (4) on arm (2). Use 7/16 inch open end and 7/16 inch box end wrenches. Tighten without binding clevis on arm.



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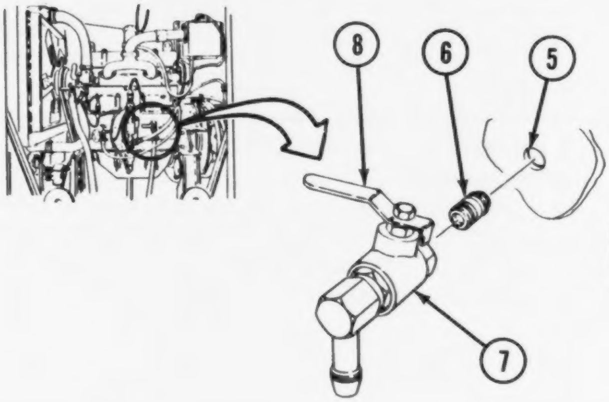
10. INSTALL ENGINE INLET BALL VALVE WITH CLOSE NIPPLE ON ENGINE.
    - Remove plug and cap from engine port (5) and close nipple (6).
    - Apply sealant to threads of close nipple (6).
    - Install valve (7) with close nipple (6) on engine, with valve handle (8) on top. Use 10 inch adjustable wrench.



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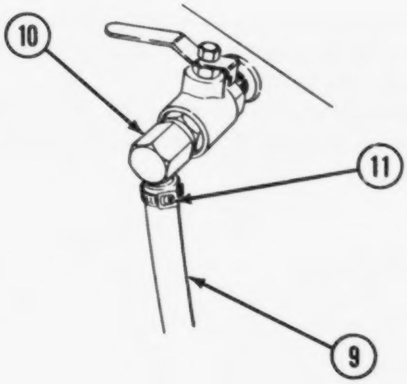
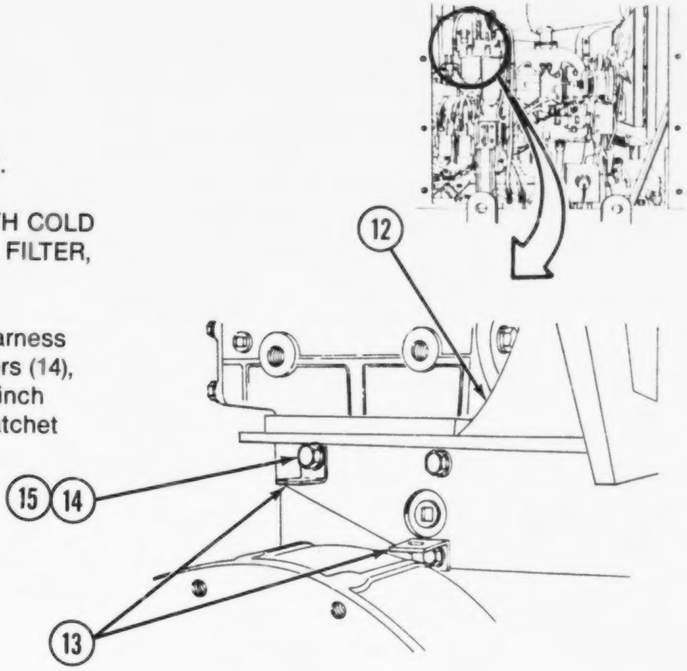
- Remove plug and cap from coolant heater to engine hose (9) and elbow (10).
- Connect coolant heater to engine hose (9) to elbow (10), and tighten clamp screw (11). Use 5/16 inch flat tip screwdriver.



**CAUTION**

Fuel filter bracket with attached assemblies can fall and be damaged during installation. Use helper when installing screws on fuel filter bracket.

11. INSTALL FUEL FILTER BRACKET WITH COLD START, ELECTRIC FUEL PUMP, FUEL FILTER, FUEL STRAINER, AND OIL FILTER ASSEMBLIES ON ENGINE.
    - Install fuel filter bracket (12), two harness brackets (13), three new lock washers (14), and screws (15) on engine. Use 5/8 inch socket with 5 inch extension and ratchet handle. Use helper.



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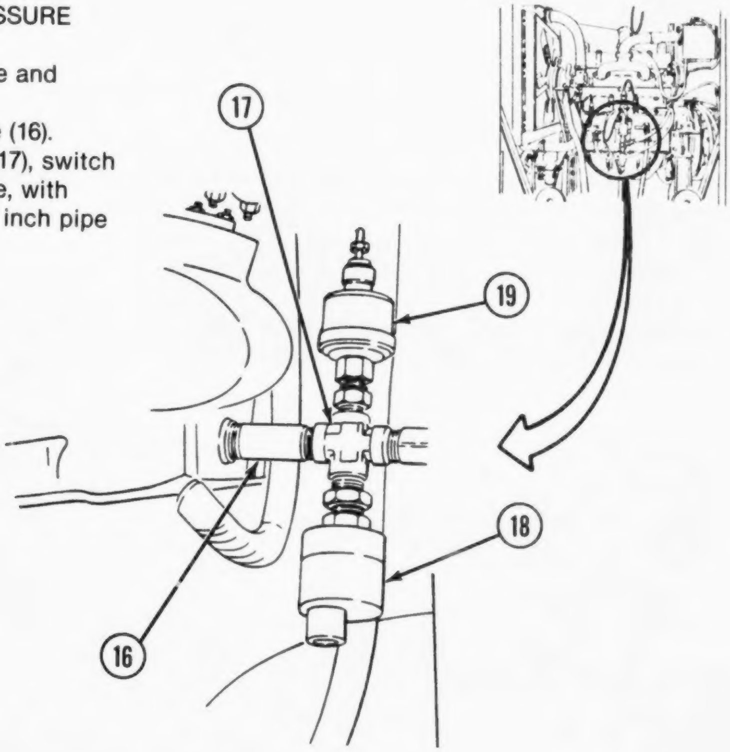
12. INSTALL NIPPLE WITH CROSSPIPE, OIL PRESSURE SWITCH, AND OIL PRESSURE TRANSMITTER ON ENGINE.
    - Remove plug and cap from engine and nipple (16).
    - Apply sealant to threads of nipple (16).
    - Install nipple (16) with crosspipe (17), switch (18), and transmitter (19) on engine, with switch (18) pointing down. Use 10 inch pipe wrench.



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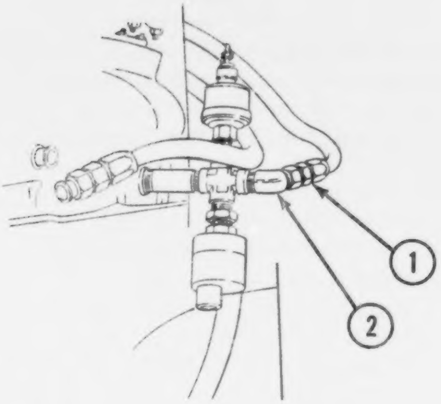
## B. INSTALLATION — Continued

13. CONNECT OIL PRESSURE HOSE ASSEMBLY TO CROSSPIPE ELBOW.
    - Remove plug and cap from hose (1) and elbow (2).
    - Connect hose (1) to elbow (2). Use 7/8 inch open end and 10 inch adjustable wrenches.



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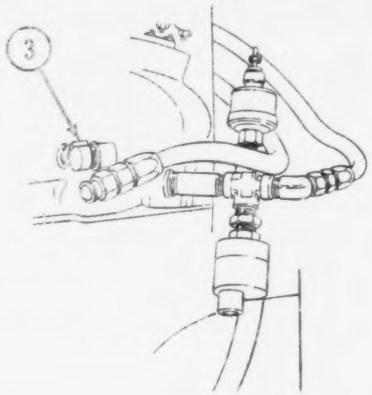
14. INSTALL 45° ELBOW ON ENGINE.
    - Remove plug and cap from engine and elbow (3).
    - Apply sealant to threads of elbow (3).
    - Install elbow (3) on engine, with elbow pointing towards rear of engine. Use 10 inch adjustable wrench.



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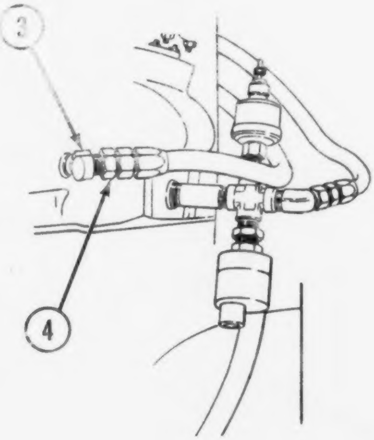
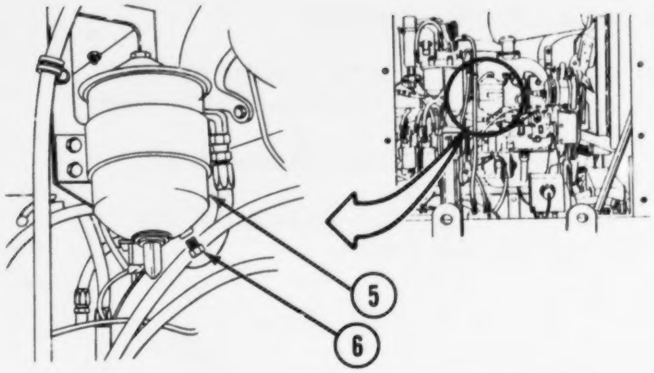
15. CONNECT OIL RETURN HOSE ASSEMBLY TO 45° ELBOW.
    - Remove plug and cap from hose (4) and elbow (3).
    - Connect hose (4) to elbow (3). Use 7/8 inch open end and 10 inch adjustable wrenches.



16. INSTALL DRAIN PLUG IN OIL FILTER ASSEMBLY.
    - Remove plug from filter assembly (5).
    - Install drain plug (6) in filter assembly (5). Use 6 inch adjustable wrench.



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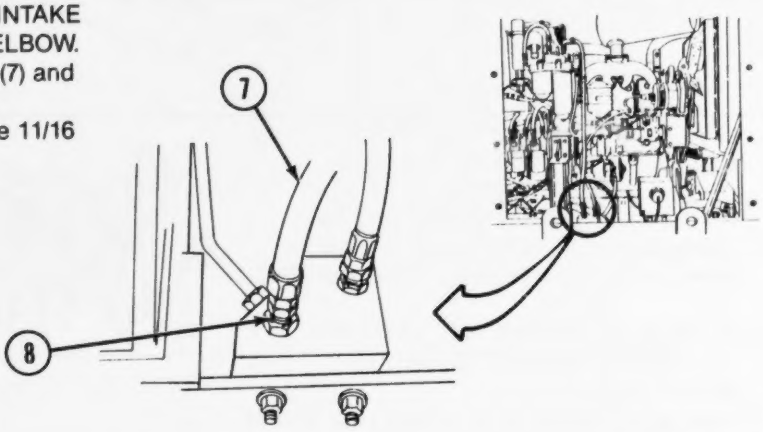
17. CONNECT ELECTRIC FUEL PUMP INTAKE HOSE ASSEMBLY TO BULKHEAD ELBOW.
    - Remove plug and cap from hose (7) and elbow (8).
    - Connect hose (7) to elbow (8). Use 11/16 inch open end wrench.



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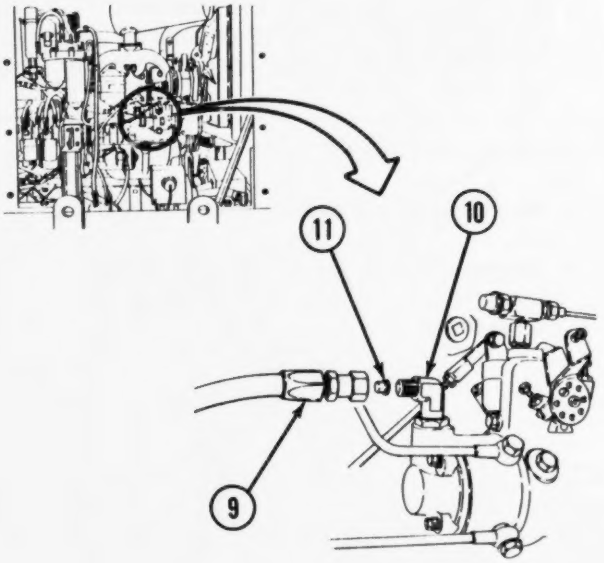
**WARNING**

Fuel can catch fire and burn you. NO SMOKING. Wipe up spilled fuel.

18. CONNECT FUEL FILTER TO FUEL INJECTION PUMP HOSE ASSEMBLY TO FUEL INJECTION PUMP ELBOW.
    - Remove plug and cap from hose (9) and elbow (10).
    - Connect hose (9) with eyelet (11) to elbow (10). Use 11/16 inch open end wrench.



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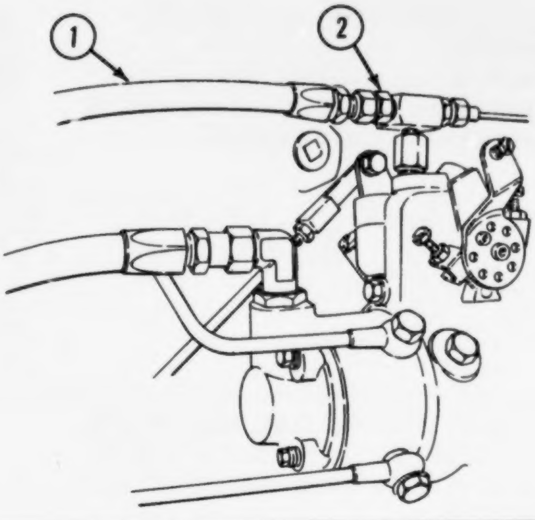
**B. INSTALLATION — Continued**

19. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL INJECTION PUMP ADAPTER.
    - Remove plug and cap from hose (1) and adapter (2).
    - Connect hose (1) to adapter (2). Use 9/16 inch open end wrench.



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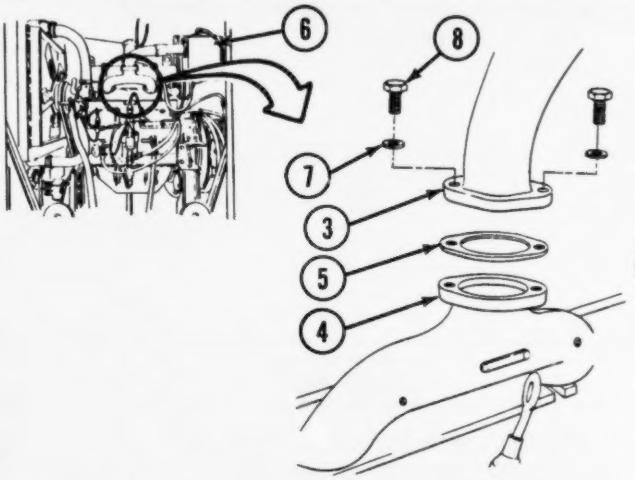
**CAUTION**

Air cleaner assembly can fall and be damaged during installation. Use helper when installing screws on intake manifold.

20. INSTALL AIR INTAKE PIPE WITH AIR CLEANER ASSEMBLY ON INTAKE MANIFOLD.
    - Remove rags from air intake pipe (3) and intake manifold (4).
    - Install new gasket (5), air intake pipe (3) with air cleaner assembly (6), two new lock washers (7), and screws (8) on intake manifold (4). Use 5/8 inch open end wrench. Use helper.



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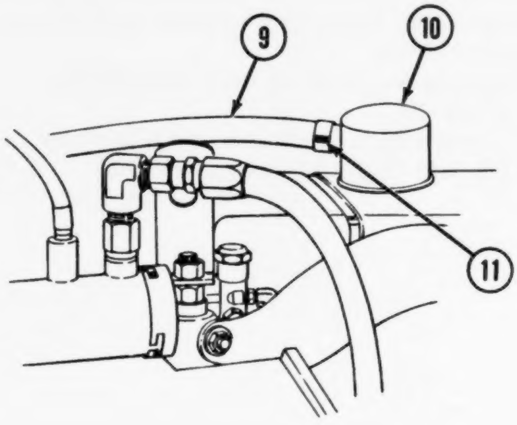
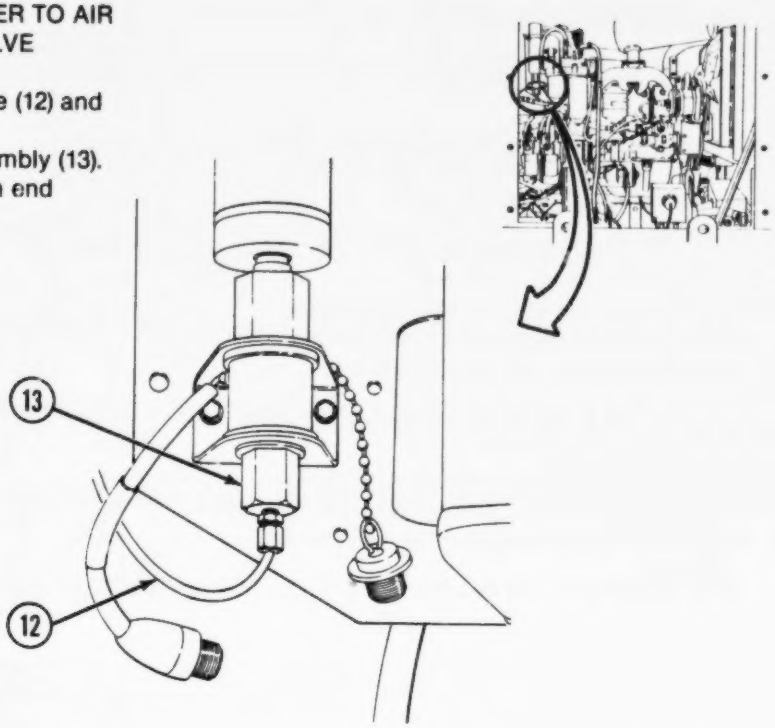
21. CONNECT BREATHER HOSE TO BREATHER CAP.
    - Remove plug and cap from hose (9) and cap (10).
    - Connect hose (9) to cap (10), and tighten clamp screw (11). Use 1/4 inch flat tip screwdriver.



22. CONNECT ETHER FUEL CYLINDER TO AIR INTAKE TUBE TO ACTUATOR VALVE ASSEMBLY.
    - Remove plug and cap from tube (12) and valve assembly (13).
    - Connect tube (12) to valve assembly (13). Use 7/16 inch and 3/8 inch open end wrenches.



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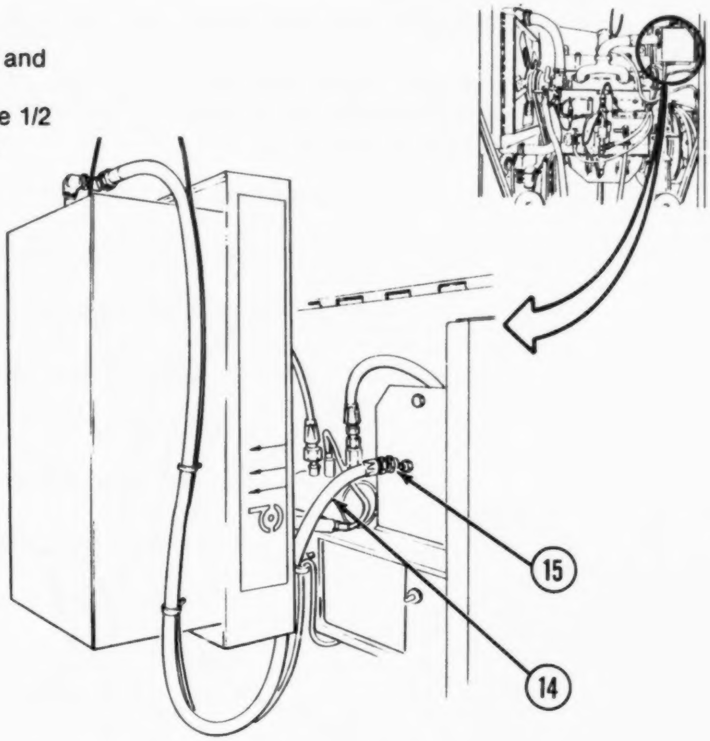
23. CONNECT AIR FILTER SERVICE AIR INDICATOR HOSE TO ADAPTER.
    - Remove plug and cap from hose (14) and adapter (15).
    - Connect hose (14) to adapter (15). Use 1/2 inch open end and 6 inch adjustable wrenches.



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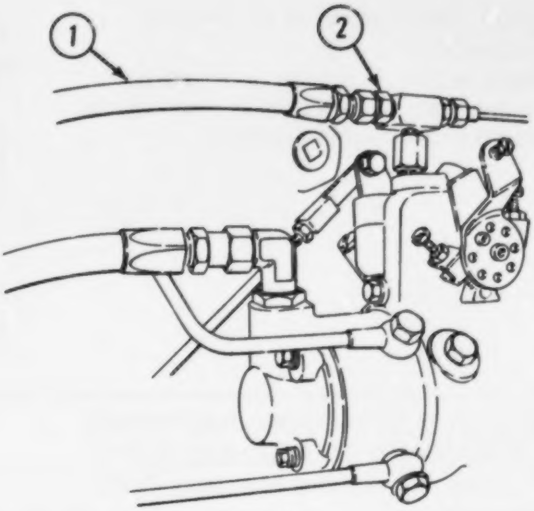
**B. INSTALLATION — Continued**

19. CONNECT FUEL INJECTION PUMP RETURN HOSE ASSEMBLY TO FUEL INJECTION PUMP ADAPTER.
    - Remove plug and cap from hose (1) and adapter (2).
    - Connect hose (1) to adapter (2). Use 9/16 inch open end wrench.



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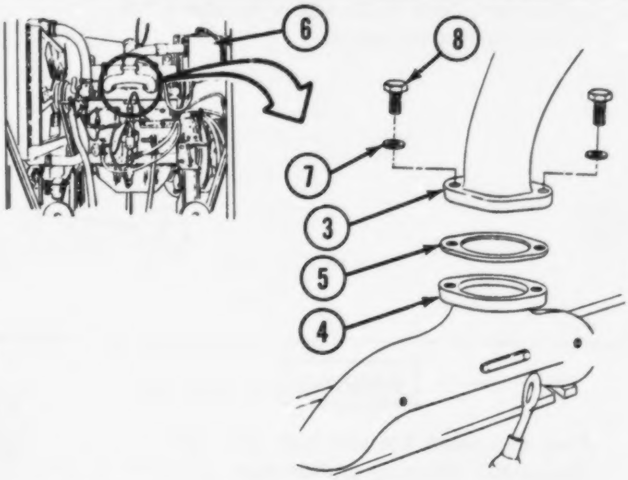
**CAUTION**

Air cleaner assembly can fall and be damaged during installation. Use helper when installing screws on intake manifold.

20. INSTALL AIR INTAKE PIPE WITH AIR CLEANER ASSEMBLY ON INTAKE MANIFOLD.
    - Remove rags from air intake pipe (3) and intake manifold (4).
    - Install new gasket (5), air intake pipe (3) with air cleaner assembly (6), two new lock washers (7), and screws (8) on intake manifold (4). Use 5/8 inch open end wrench. Use helper.



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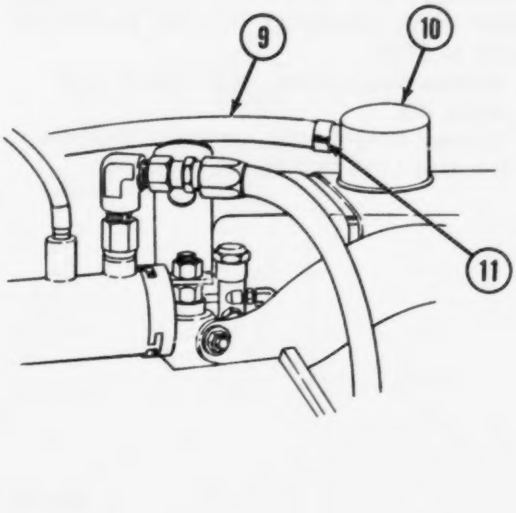
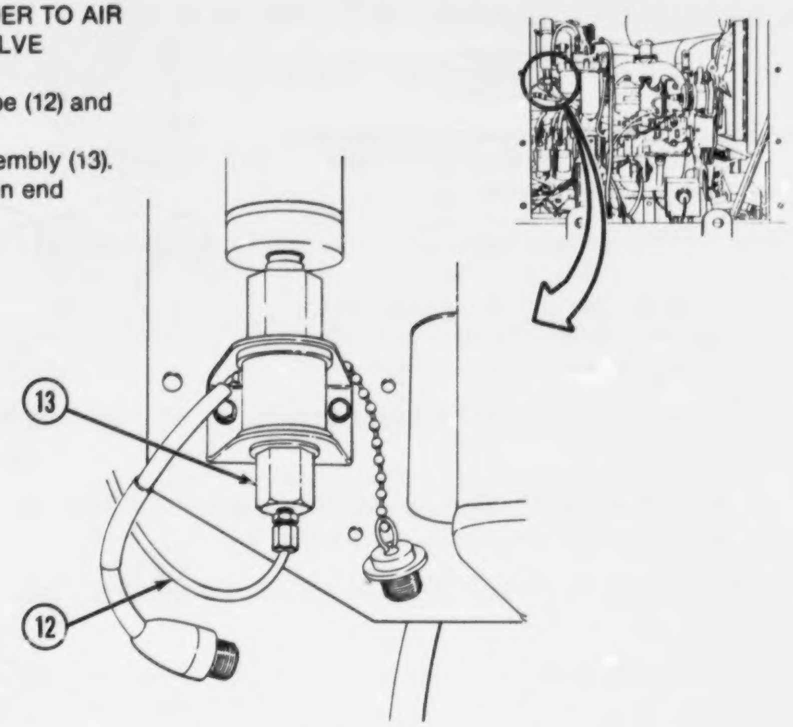
21. CONNECT BREATHER HOSE TO BREATHER CAP.
    - Remove plug and cap from hose (9) and cap (10).
    - Connect hose (9) to cap (10), and tighten clamp screw (11). Use 1/4 inch flat tip screwdriver.



22. CONNECT ETHER FUEL CYLINDER TO AIR INTAKE TUBE TO ACTUATOR VALVE ASSEMBLY.
    - Remove plug and cap from tube (12) and valve assembly (13).
    - Connect tube (12) to valve assembly (13). Use 7/16 inch and 3/8 inch open end wrenches.



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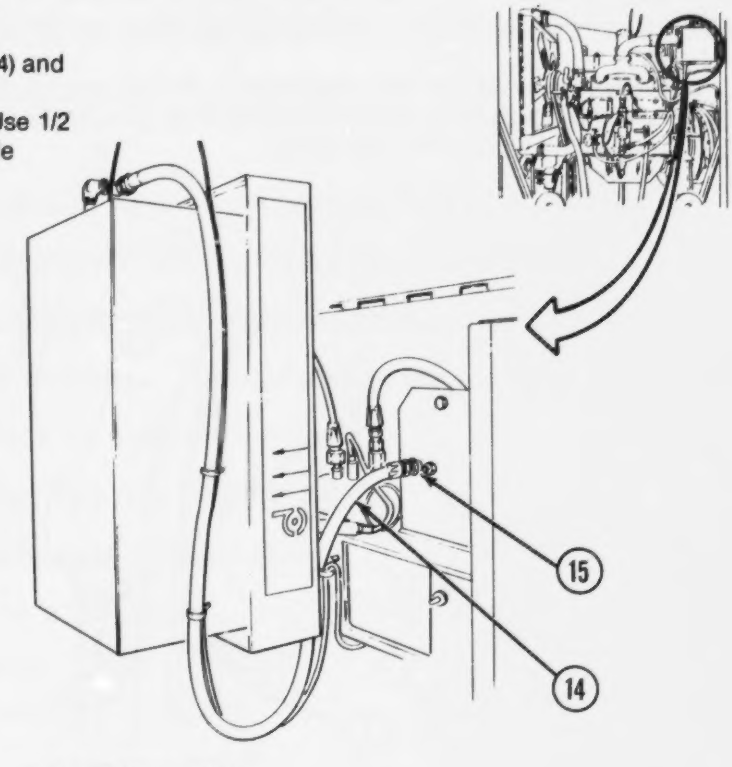
23. CONNECT AIR FILTER SERVICE AIR INDICATOR HOSE TO ADAPTER.
    - Remove plug and cap from hose (14) and adapter (15).
    - Connect hose (14) to adapter (15). Use 1/2 inch open end and 6 inch adjustable wrenches.



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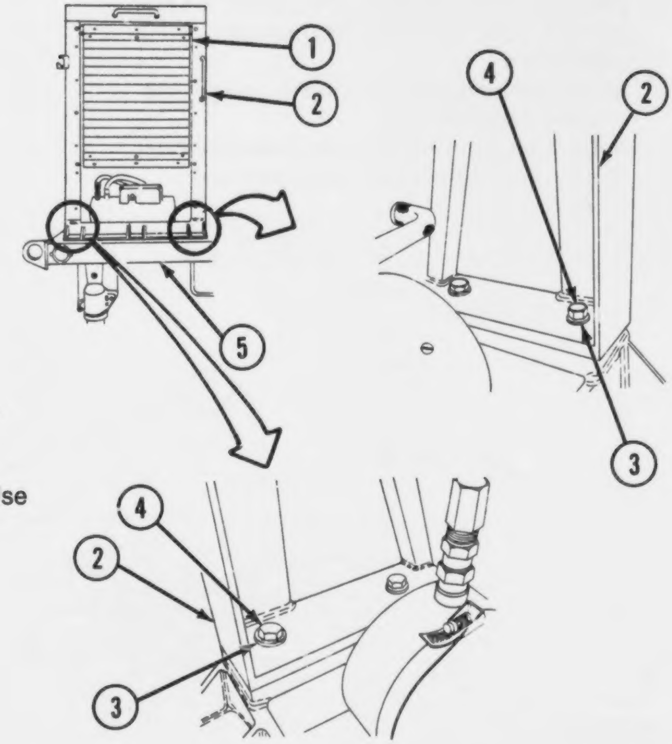
## B. INSTALLATION — Continued



**WARNING**

You could be hurt if heavy dispenser parts fall on you. Use helper when you remove or install heavy dispenser parts.

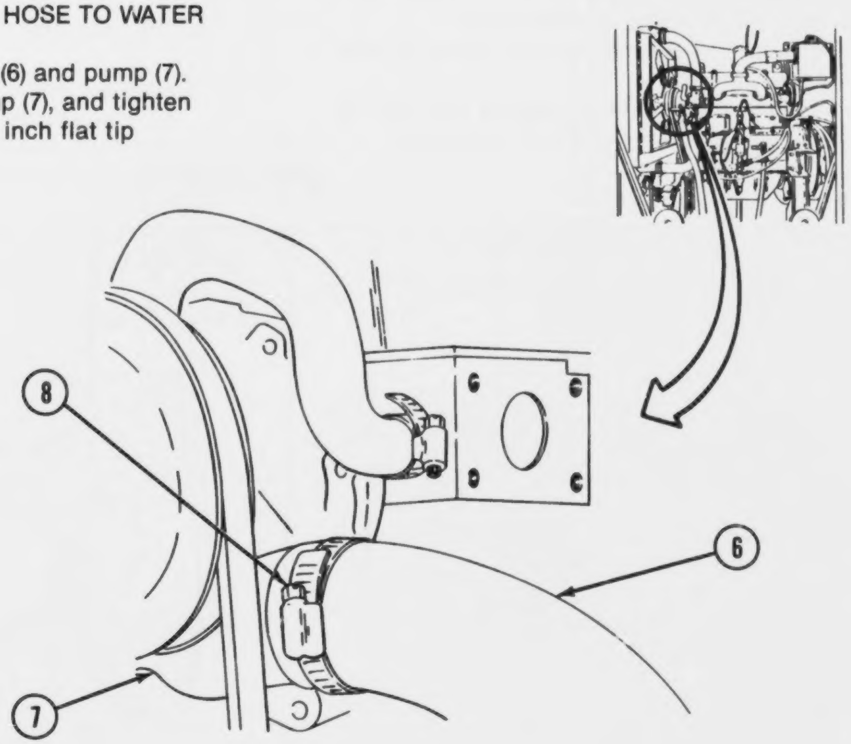
**CAUTION**

Radiator can fall and be damaged during istallation. Use helper when installing mounting screws on radiator supports.

24. INSTALL RADIATOR WITH TWO SUPPORTS ON PALLET.
    - Install radiator (1) with supports (2), four washers (3), and screws (4) on pallet (5). Use 3/4 inch socket with ratchet handle. Use helper.

---

25. CONNECT ENGINE INLET HOSE TO WATER PUMP.
    - Remove rags from hose (6) and pump (7).
    - Connect hose (6) to pump (7), and tighten clamp screw (8). Use 1/4 inch flat tip screwdriver.



26. INSTALL ENGINE CONTROL BRACKET ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

27. INSTALL HYDRAULIC PUMP DRIVE WITH DRIVE SHAFT ON DISPENSER. (SEE PUMP DRIVE INSTALLATION, PAGE 15-263.)

28. INSTALL RIGHT MAGAZINE PUMP ON DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)

29. INSTALL RIGHT SERVO ACTUATOR ON DISPENSER. (SEE RIGHT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-351.)

30. INSTALL LAUNCHER PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

31. INSTALL OSCILLATOR PUMP ON DISPENSER. (SEE LAUNCHER AND OSCILLATOR PUMPS INSTALLATION, PAGE 15-275.)

32. INSTALL LEFT MAGAZINE PUMP ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

33. INSTALL LEFT SERVO ACTUATOR ON DISPENSER. (SEE LEFT MAGAZINE PUMP ASSEMBLY AND SERVO ACTUATOR, PAGE 15-307.)

34. INSTALL SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY ON DISPENSER. (SEE SPEED CONTROL TRANSMITTER AND SHAFT ASSEMBLY, PAGE 15-15.)

35. INSTALL THERMOSTAT HOUSING ON DISPENSER. (SEE TM 9-1095-205-20.)

36. INSTALL ENGINE ELECTRICAL ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

37. INSTALL SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET ON DISPENSER. (SEE SERVO ACTUATOR HYDRAULIC LINE FILTER ASSEMBLIES AND FILTER BRACKET, PAGE 15-409.)

38. INSTALL MAIN CONTROL PANEL MOUNTING BRACKET ON DISPENSER. (SEE TM 9-1095-205-20.)

39. INSTALL MAIN CONTROL PANEL ASSEMBLY ON DISPENSER. (SEE TM 9-1095-205-20.)

40. INSTALL FIXED PANEL SUPPORT ON DISPENSER. (SEE TM 9-1095-205-20.)

41. INSTALL ENGINE ASSEMBLY TOP ON DISPENSER. (SEE TM 9-1095-205-20.)

42. INSTALL MUFFLER ON DISPENSER. (SEE TM 9-1095-205-20.)

43. INSTALL NEGATIVE LEAD ON NO. 2 BATTERY. (SEE TM 9-1095-205-20.)

44. CLOSE RIGHT BATTERY BOX COVER. (SEE TM 9-1095-205-10.)

45. OPEN FUEL SHUTOFF VALVE. (SEE TM 9-1095-205-10.)

46. FILL FUEL TANK. (SEE TM 9-1095-205-10.)

GO TO NEXT PAGE

**B. INSTALLATION — Continued**

47. FILL HYDRAULIC RESERVOIR. (SEE TM 9-1095-205-20.)

48. FILL ENGINE CRANKCASE. (SEE LO 9-1095-205-12.)

49. FILL RADIATOR. (SEE TM 9-1095-205-20.)

50. ADJUST FUEL CONTROL LINKAGE. (SEE TM 9-1095-205-20.)

51. START ENGINE. (SEE TM 9-1095-205-10.) CHECK FOR LEAKS.

**NOTE**

If installing old engine, go to step 54.

52. ADJUST VALVE CLEARANCE. (SEE TM 9-1095-205-20.)

53. ADJUST ENGINE IDLE SPEED. (SEE FUEL INJECTION PUMP, PAGE 15-161.)

54. STOP ENGINE. (SEE TM 9-1095-205-20.)

**NOTE**

***FOLLOW-ON MAINTENANCE:***
Place Fuel System In Service. (See TM 9-1095-205-20.)
Place Hydraulic System In Service. (See TM 9-1095-205-20.)
Stop Engine. (See TM 9-1095-205-20.)
Adjust Launcher Pump Linkage. (See Launcher Pump Linkage Adjustment, Page 15-303.)
Adjust Magazine Pumps Linkage. (See Magazine Pumps Linkage Adjustment, Page 15-401.)
Install Control Box Storage Assembly. (See TM 9-1095-205-20.)
Stow Manual Crank. (See TM 9-1095-205-10.)
Stow Rawhide Mallet. (See TM 9-1095-205-10.)
Stow Operator's Manual. (See TM 9-1095-205-10.)
Install Front Panel. (See TM 9-1095-205-20.)
Install Fixed Panel. (See TM 9-1095-205-20.)
Install Hinged Panel. (See TM 9-1095-205-20.)
Shut Down Dispenser. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-36 ROTARY OIL PUMP STRAINER

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-513)
B. INSTALLATION (p 15-514)

### INITIAL SETUP

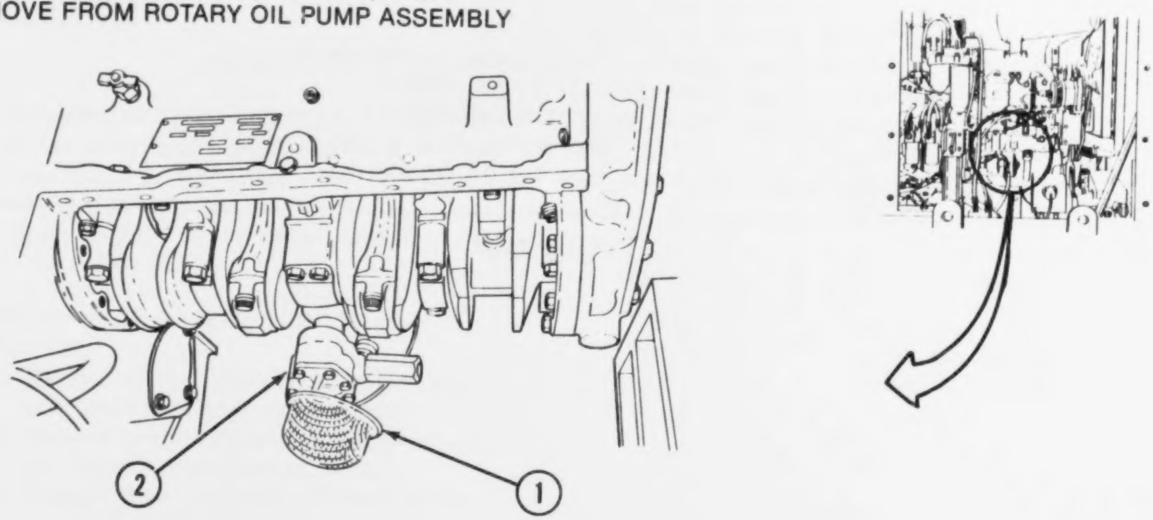
*References:*
LO 9-1095-205-12
TM 9-1095-205-10
TM 9-1095-205-20
OIL PAN ASSEMBLY, Page 15-247

### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Open Right Battery Box Cover. (See TM 9-1095-205-10.)
Remove Negative Lead From No. 2 Battery. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)
Remove Engine Fixed Panel. (See TM 9-1095-205-20.)
Remove Engine Fixed Panel Support. (See TM 9-1095-205-20.)
Remove Starter. (See TM 9-1095-205-20.)
Drain Engine Oil. (See LO 9-1095-205-12.)
Remove Engine Oil Pan. (See Oil Pan Assembly, Page 15-247.)

TURN PUMP STRAINER (1) TO LEFT, AND REMOVE FROM ROTARY OIL PUMP ASSEMBLY (2).



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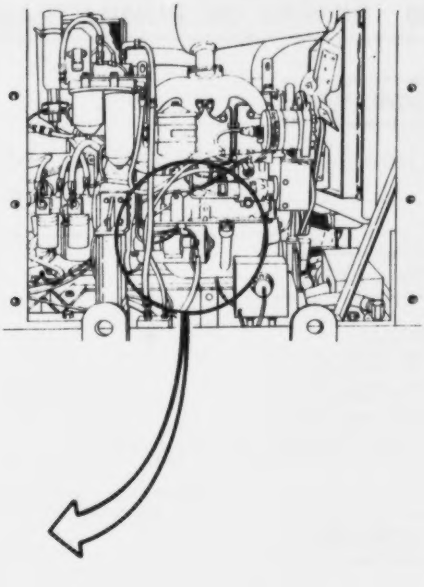
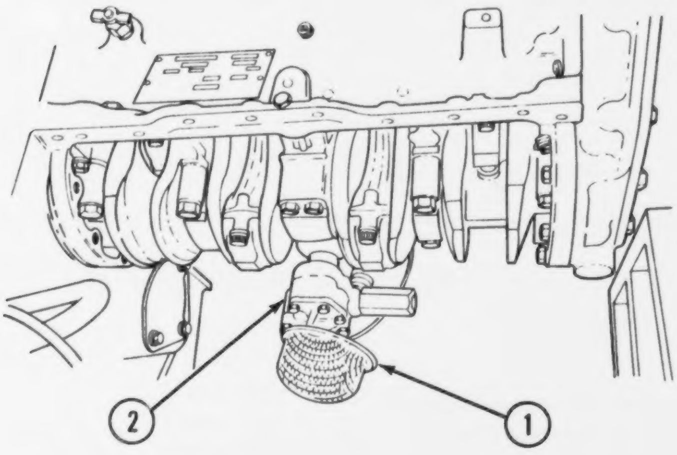
## 15-36 ROTARY OIL PUMP STRAINER — Continued

### B. INSTALLATION

INSTALL OIL PUMP STRAINER (1) ON ROTARY OIL PUMP ASSEMBLY (2).





**NOTE**

***FOLLOW-ON MAINTENANCE:***

Install Engine Oil Pan. (See Oil Pan Assembly, Page 15-247.)
Fill Engine Crankcase. (See LO 9-1095-205-12.)
Install Starter. (See TM 9-1095-205-20.)
Install Engine Fixed Panel Support. (See TM 9-1095-205-20.)
Install Engine Fixed Panel. (See TM 9-1095-205-20.)
Close Engine Hinged Panel. (See TM 9-1095-205-10.)
Install Negative Lead On No. 2 Battery. (See TM 9-1095-205-20.)
Close Right Battery Box Cover. (See TM 9-1095-205-10.)

---

END OF TASK

## 15-37 SERVO ACTUATOR FILTER ASSEMBLIES

### DESCRIPTION

This task covers:
A. REMOVAL (p 15-515)
B. INSTALLATION (p 15-516)

### INITIAL SETUP

***Tools and Special Tools:***
General mechanic's tool kit
5180-00-177-7033:
11/16 inch open end wrench

***Materials/Parts:***
Filter assembly 2910-00-495-7592
Preformed packing (19200) 3-906

***Reference:***
TM 9-1095-205-10

**CAUTION**

Excessive dust and water can damage hydraulic system. Do not open hydraulic system when these conditions exist. Clean outside surfaces before opening hydraulic system.

### OVERVIEW

Before opening any hydraulic system line, loosen hydraulic reservoir filler cap to relieve pressure.

Each servo actuator has one servo actuator filter assembly. Remove and install each filter assembly the same way.

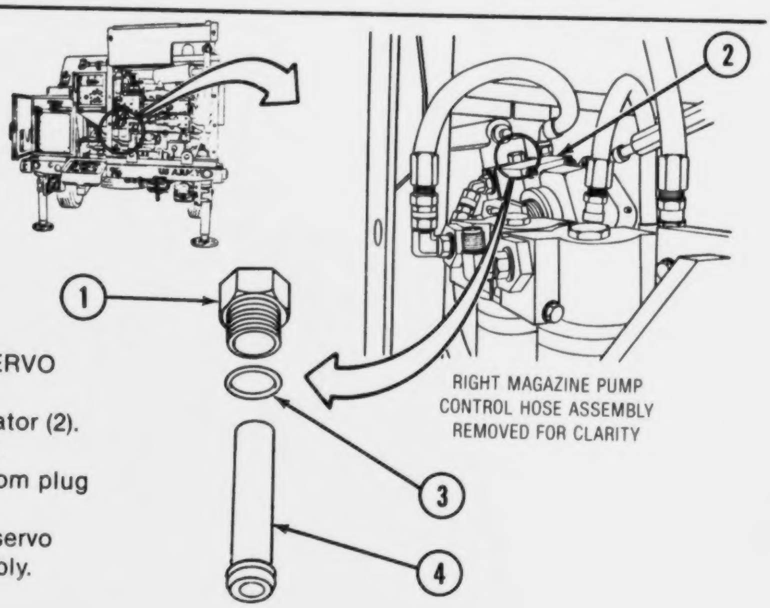
### A. REMOVAL

**NOTE**

***PRELIMINARY PROCEDURES:***
Release Hydraulic Pressure From Hydraulic Accumulator. (See TM 9-1095-205-20.)
Open Engine Hinged Panel. (See TM 9-1095-205-10.)

REMOVE FILTER ASSEMBLY FROM SERVO ACTUATOR.

- Remove plug (1) from servo actuator (2). Use 11/16 inch open end wrench.
- Remove preformed packing (3) from plug (1). Discard preformed packing.
- Remove filter assembly (4) from servo actuator (2). Discard filter assembly.



RIGHT MAGAZINE PUMP CONTROL HOSE ASSEMBLY REMOVED FOR CLARITY

GO TO NEXT PAGE

## 15-37 SERVO ACTUATOR FILTER ASSEMBLIES — Continued

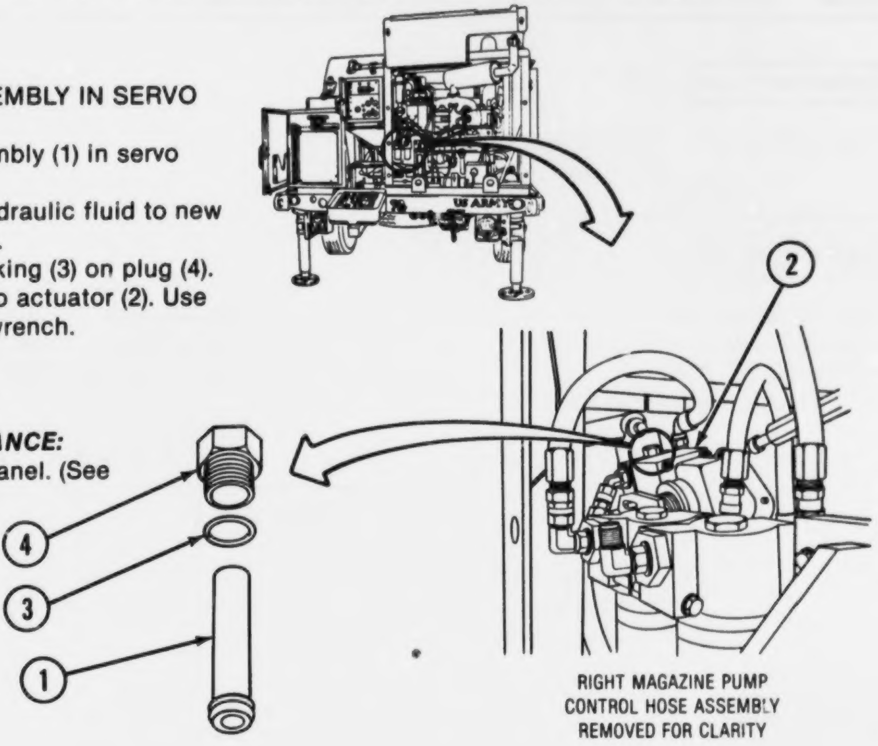
### B. INSTALLATION

INSTALL NEW FILTER ASSEMBLY IN SERVO ACTUATOR.

- Place new filter assembly (1) in servo actuator (2).
- Apply light coat of hydraulic fluid to new preformed packing (3).
- Install preformed packing (3) on plug (4).
- Install plug (4) in servo actuator (2). Use 11/16 inch open end wrench.

NOTE

***FOLLOW-ON MAINTENANCE:***
Close Engine Hinged Panel. (See TM 9-1095-205-10.)


2
4
3
1
RIGHT MAGAZINE PUMP
CONTROL HOSE ASSEMBLY
REMOVED FOR CLARITY

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END OF TASK

## 15-38 FUEL INJECTION PUMP BENCH TEST

### DESCRIPTION

This task covers: CHECKS AND ADJUSTMENTS (p 15-517)

### INITIAL SETUP

***Tools and Special Tools:***

General mechanic's tool kit
  5180-00-177-7033:
    1/4 inch flat tip screwdriver
Test stand with accessories
Roosa master special tool fixture
  assembly #13366

***Materials/Parts:***

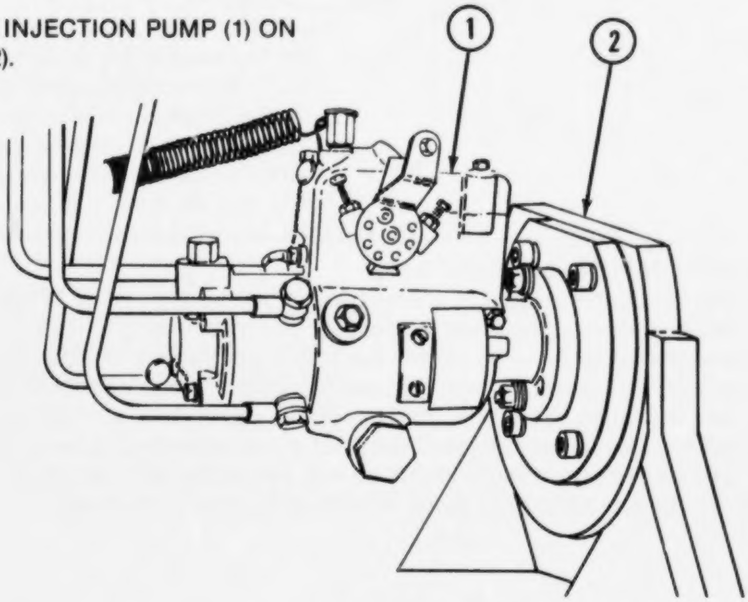
Cover gasket 5330-00-506-3975
Advance spring shim 2910-00-786-6343

### CHECKS AND ADJUSTMENTS

**NOTE**

The following conditions apply for checks and adjustments:
  Test bench injection lines: 3/32 ID and 20 in. (50.8 cm) length
  Testing fuel:
    Rating: 34 — 36 saybolt seconds universal (SSU) at 100°F (37.8°C)
    Temperature: Maintain at 110 — 115°F (43.3 — 46.1°C)
  Test stand fuel nozzles: 2500 psi opening pressure
  Fuel pump rotation: Clockwise.

1. INSTALL FUEL INJECTION PUMP (1) ON TEST STAND (2).



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**CHECKS AND ADJUSTMENTS — Continued**

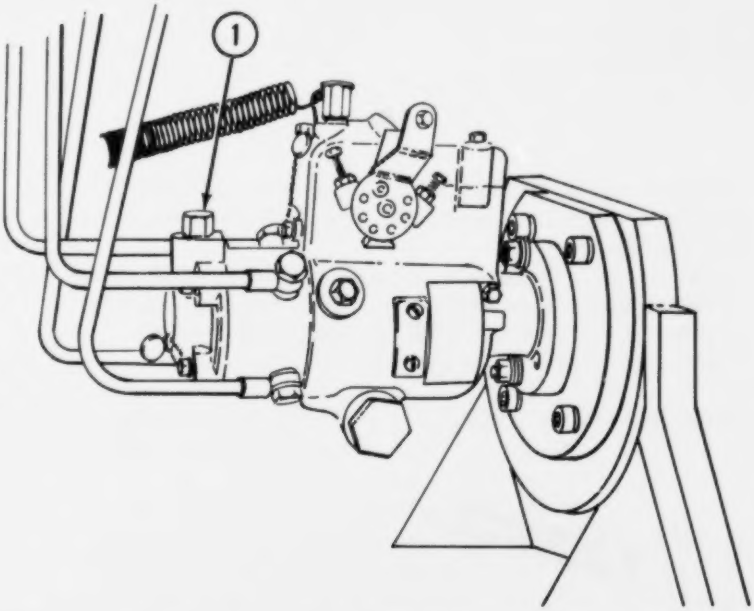
2. CHECK FUEL INJECTION PUMP SUCTION.
   - Pump suction should be at least 18 in. Hg at pump speed of 200 rpm with throttle wide open. If pump suction is not correct, dispose of pump according to local procedures.

---

**NOTE**

Turn pump pressure regulating spring to right to increase pump pressure or to left to decrease pump pressure.

3. CHECK FUEL INJECTION PUMP PRESSURE.
   - Pump pressure should be 70 — 75 psi at pump speed of 900 rpm with throttle wide open. If pump pressure is not correct, adjust pump pressure regulating spring (1) until pump pressure is correct.
   - Pump pressure should be at least 8 psi at pump speed of 75 rpm with throttle wide open. If pump pressure is not correct, adjust pump pressure regulating spring (1) until pump pressure is correct.



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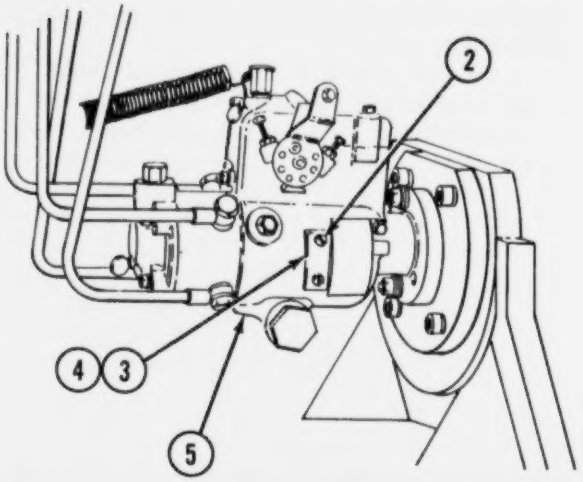
4. CHECK FUEL INJECTION PUMP DELIVERY RATE.
   - Pump delivery rate should be at least 27 cu mm per stroke per injector at 75 rpm with throttle wide open. If pump delivery rate is not correct, dispose of pump according to local procedures.
   - Pump delivery rate should be 52 — 55 cu mm per stroke per injector at 1000 rpm with throttle wide open. If pump delivery rate is not correct, dispose of pump according to local procedures.
   - Pump delivery rate should be 13 — 17 cu mm per stroke per injector at 1100 rpm with throttle wide open. If pump delivery rate is not correct, dispose of pump according to local procedures.
   - Pump delivery rate should be not more than 7 cu mm per stroke per injector at 1125 rpm. If pump delivery rate is not correct, dispose of pump according to local procedures.

5. REMOVE TIMING COVER FROM FUEL INJECTION PUMP.
   - Remove two screws (2), cover (3), and cover gasket (4) from pump (5). Use 1/4 inch flat tip screwdriver. Discard gasket.



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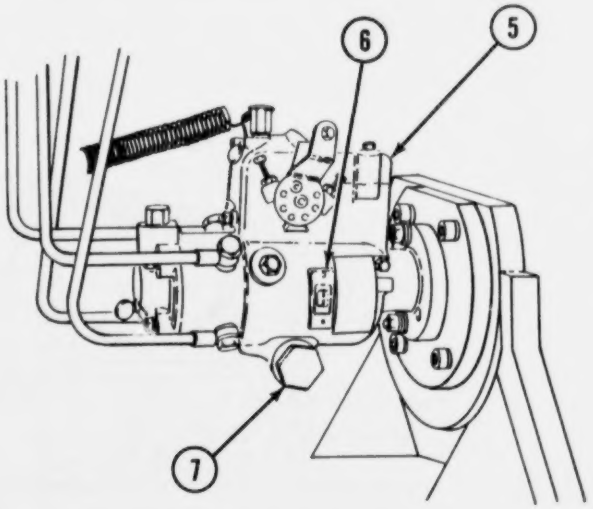
**NOTE**

Automatic advance is raised and lowered by adjusting the thickness of advance-spring shims. Reduce shim thickness to lower advance, and increase shim thickness to raise advance.

6. CHECK FUEL INJECTION PUMP AUTOMATIC ADVANCE.
   - Install automatic advance test fixture on pump (5).
   - Look through timing window (6), and check automatic advance at pump speed of 600 rpm. Automatic advance should be 1°. If automatic advance is not correct, adjust thickness of advance-spring shims under plug (7) until automatic advance is correct.
   - Look through timing window (6), and check automatic advance at pump speed of 1100 rpm. Automatic advance should be 6°. If automatic advance is not correct, adjust thickness of advance-spring shims under plug (7) until automatic advance is correct.
   - Remove automatic advance test fixture from pump (5).



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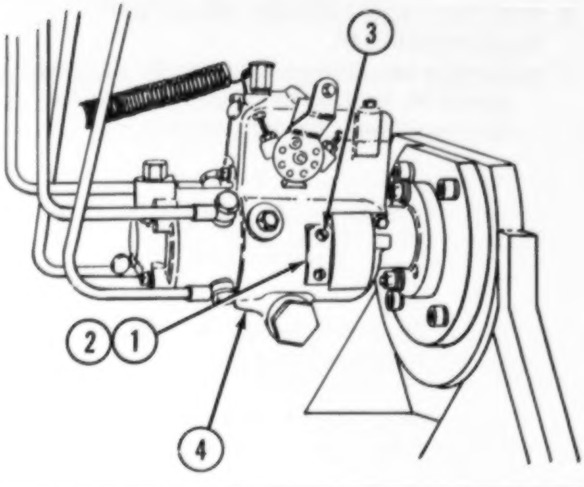
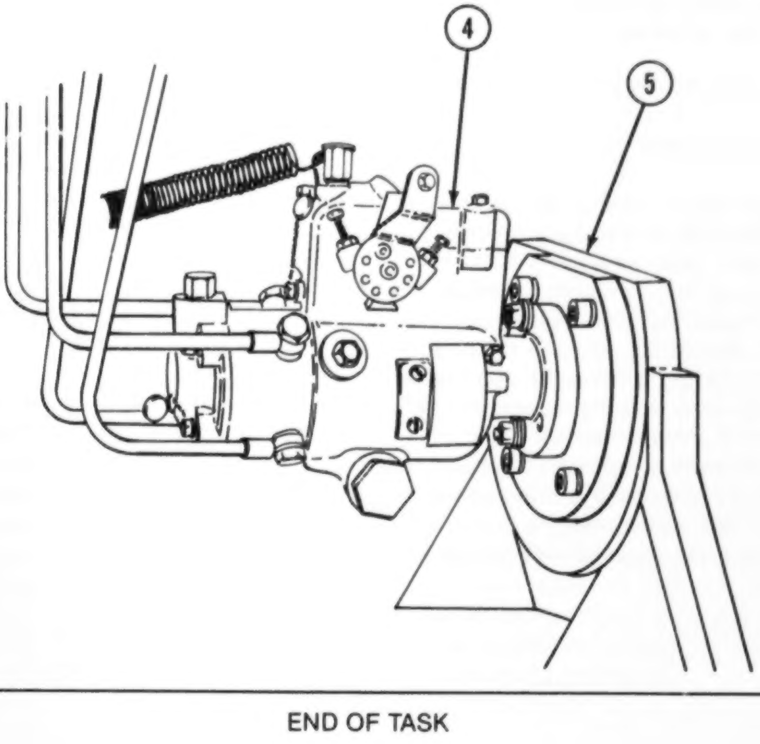
**CHECKS AND ADJUSTMENTS — Continued**

7. INSTALL TIMING COVER ON FUEL INJECTION PUMP.
   - Install new cover gasket (1), cover (2), and two screws (3) on pump (4). Use 1/4 inch flat tip screwdriver.



8. CHECK FUEL INJECTION PUMP ELECTRIC CUT-OFF.
   - Pump delivery rate shall be no more than 3 cu mm per stroke per injector at 1000 rpm with throttle wide open. If pump delivery rate is not correct, dispose of pump according to local procedures.
   - Pump delivery rate shall be no more than 3 cu mm per stroke per injector at 200 rpm with throttle wide open. If pump delivery rate is not correct, dispose of pump according to local procedures.

9. REMOVE FUEL INJECTION PUMP (4) FROM TEST STAND (5).



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### WEIGHTS
1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE
1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE
1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

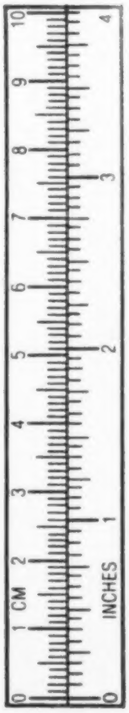
### CUBIC MEASURE
1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

### TEMPERATURE
5/9 (°F − 32) = °C
212° Farenheit is equivalent to 100° Celsius
90° Farenheit is equivalent to 32.2° Celsius
32° Farenheit is equivalent to 0° Celsius
9/5 (°C) + 32 = °F

## APPROXIMATE CONVERSION FACTORS

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Inches | Centimeters | 2.540 |
| Feet | Meters | 0.305 |
| Yards | Meters | 0.914 |
| Miles | Kilometers | 1.609 |
| Square Inches | Square Centimeters | 6.451 |
| Fluid Ounces | Milliliters | 29.573 |
| Pints | Liters | 0.473 |
| Quarts | Liters | 0.946 |
| Gallons | Liters | 3.785 |
| Ounces | Grams | 28.349 |
| Pounds | Kilograms | 0.454 |
| Short Tons | Metric Tons | 0.907 |
| Pounds per Square Inch | Kilopascals | 6.895 |
| Pounds per Square Inch | Kilograms per Square Centimeter | 0.070 |
| Miles per Gallon | Kilometers per Liter | 0.425 |
| Miles per Hour | Kilometers per Hour | 1.609 |

| TO CHANGE | TO | MULTIPLY BY |
|---|---|---|
| Centimeters | Inches | 0.394 |
| Meters | Feet | 3.280 |
| Meters | Yards | 1.094 |
| Kilometers | Miles | 0.621 |
| Square Centimeters | Square Inches | 0.155 |
| Milliliters | Fluid Ounces | 0.034 |
| Liters | Pints | 2.113 |
| Liters | Quarts | 1.057 |
| Liters | Gallons | 0.264 |
| Grams | Ounces | 0.035 |
| Kilograms | Pounds | 2.205 |
| Metric Tons | Short Tons | 1.102 |
| Kilograms per Square Centimeter | Pounds per Square Inch | 14.220 |
| Kilopascals | Pounds per Square Inch | 0.145 |
| Kilometers per Liter | Miles per Gallon | 2.354 |
| Kilometers per Hour | Miles per Hour | 0.621 |



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